



USDA FOREST SERVICE

Rocky Mountain Region 2

R2 Roads Analysis
Supplement to FS-643

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Introduction

The Roads Analysis process is fully discussed in Miscellaneous Report FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System. **Roads Analysis is not a NEPA process.** It is an integrated ecological, social, and economic approach to transportation planning, addressing both existing and future roads. The analysis process itself involves the following six steps, each fully discussed in Misc. Report FS-643.

1. Setting up the analysis.
2. Describing the situation.
3. Identifying broad issues.
4. Assessing benefits, problems, and risks.
5. Describing opportunities and setting priorities.
6. Reporting.

Step 4 of the process, assessing benefits, problems, and risks, includes a list of 71 example questions. Details about these 71 questions (including background information, information needs, and sources) can be found in Appendix 1 of Misc. Report FS-643.

This R2 Roads Analysis Supplement ties to Appendix 1 of Misc. Report FS-643; it should be used in conjunction with that document. This R2 roads analysis supplement is intended to provide guidance concerning the appropriate scale for addressing each question and the analysis needed. This document was developed by a variety of regional employees beginning in the summer of 1999. It has been consistently updated. It will continue to be updated.

How to Use This Guidance Package

As stated above, this supplement is designed for use with Appendix 1 of Misc. Report FS-643. In this supplement there are 67 questions grouped into 12 major topics (listed below). FS-643 has 71 questions. R2 added an additional 2 questions. In FY02, a National group met and revised the passive-use, social issues, and civil rights questions. Thus, there are a total of 67 questions.

TOPICS	
<ul style="list-style-type: none"> • Aquatics (AQ) • Terrestrial Wildlife (TW) • Ecosystem Function (EF) • Economics (EC) • Commodity Production <ul style="list-style-type: none"> – Timber Management (TM) – Minerals Management (MM) – Range Management (RM) – Water Projects (WP) – Special Products (SP) – Special Use Permits (SU) 	<ul style="list-style-type: none"> • General Public Transportation (GT) • Administrative Use (AU) • Protection (PT) • Recreation <ul style="list-style-type: none"> – Unroaded Recreation (UR) – Road-related Recreation (RR) • Passive Use (PV) • Social Issues (SI) • Civil Rights and Environmental Justice (CR)

For each question, the team determined which analysis items were best addressed at a forest plan scale and which were best addressed at a subforest scale. Many of the questions are related. A question crosswalk is provided in the Appendix.

The subforest scale direction is used when doing landscape assessments or project planning. The team recommends the subforest-scale analysis be done on watersheds, where possible. Ideally, using this approach will permit a better assessment of “cumulative” effects. A scale that is too small fails to capture the true costs, benefits and impacts of a project. In other words, the most significant impacts of a project may result, not from its direct effects, but from the combination of individual minor effects of multiple actions within an area over time. In addition, selecting a scale too small may not establish the environmental baseline for adequately measuring change. Only on a larger scale will these impacts be more readily apparent resulting in a more complete roads analysis package. Where possible, an explanation of how the individual items are used in the forest plan and in a subforest analysis is given.

The R2 Guidance package is built around Table 1. The following is a brief description of the information presented there.

Column 1 (Question #): Click on underlined question to view.

Column 2 (Topic): Captures the overall theme of each question.

Column 3 (Forest Plan): An X indicates those questions are typically used in developing a Forest Plan but are not mandatory. Many questions require analysis that may not lead to specific direction in the forest plan but will be discussed in the EIS accompanying the plan.

Column 4 (Plan EIS): An X indicates that analysis in the EIS relates generally to the question.

Column 5 (Specific in EIS): A yes indicates that analysis in the EIS relates specifically to the question.

Column 6 (Subforest/Common Issue): Yes/no applies to analysis questions addressed at the subforest scale. If it is not a common issue, it will be dealt with if raised during scoping or if the item of concern is physically present. Only two questions were deemed irrelevant at the subforest level, as indicated by the NA in this column. The road analysis team should read each of the 73 questions to determine if it is an issue for the analysis area and document the response or reason a response is not necessary.

Column 7 (Page #): This is the page where the question is addressed in the hard-copy version of the national Roads Analysis document. This document is available via e-mail (this is the easiest method) at rschneider/rmrs@fs.fed.us or by calling Dick Schneider at (970) 498-1719. Please include the publication number (Roads Publication FS-643) if you are using e-mail or leaving a message.

Some of the questions are related. The appendix contains a question crosswalk listing questions that could be answered together and questions where the responses should be compared.

All references listed in FS-643 can be obtained through the Rocky Mountain Station library at <http://fsweb.rsl.psw.fs.fed.us/roads/request.html>.

Note: In the Web version of the national Roads Analysis document, the page numbers are different.

Table 1. Summary of Analysis Questions

Question #	Topic	Forest Plan	Plan EIS	Specific in EIS?	Subforest Common Issue	Page Number
AQ1	Hydrology	X	X	yes	yes	48
AQ2	Surface erosion	X	X	yes	yes	49
AQ3	Mass wasting	X	X	yes	no	52
AQ4	Crossings	X	X	yes	yes	55
AQ5	Chemical effects				no	57
AQ6	Hydro connections	X	X	yes	yes	59
AQ7	Beneficial uses	X	X	no	yes	63
AQ8	Wetlands	X	X	no	no	64
AQ9	Channel dynamics	X	X	no	yes	65
AQ10	Aqua. organisms	X	X	no	no	67
AQ11	Riparian/litterfall				no	70
AQ12	At-risk species	X	X	BE only	no	71
AQ13	Non-native aquatic				no	72
AQ14	Unique species	X	X	yes	no	73
TW1	Terrestrial habitat	X	X	yes	yes	75
TW2	Human activities	X	X	yes	yes	76
TW3	Legal/illegal activities	X	X	yes	yes	77
TW4	Unique communities	X	X	yes	no	80
EF1	Exotics	X	X	no	no	37
EF2	Pest management		X	no	no	40
EF3/EF4	Disturbances		X	no	no	41/42
EF5	Noise				no	43
EC1	Financial efficiency	X	X	yes	yes	81
EC2	Economic efficiency		X	yes	yes	83
EC3	Distribution		X	no	no	86
TM1	Logging systems	X	X	yes	yes	89
TM2	Suitable base	X	X	yes	yes	90
TM3	Silvicultural treatment	X	X	yes	yes	91
MM1	Minerals	X	X	yes	no	92
RM1	Range	X			no	93
WP1	Water facilities		X	yes	no	94
WP2	Municipal watershed	X	X	yes	no	94
WP3	Hydroelectric				no	95
SP1	Special products				no	95
SU1	Special uses	X	X	no	no	96
GT1	Access		X	no	no	97
GT2	Other owners		X	no	no	97
GT3	Shared ownership	X	X	no	no	98
GT4	Safety	X		no	no	99
AU1	Research, M&I	X			no	100
AU2	Law enforcement				no	100
PT1	Fuels		X	no	yes	101

Question #	Topic	Forest Plan	Plan EIS	Specific in EIS?	Subforest Common Issue	Page Number
PT2	Wildfire cooperators				no	101
PT3	Safety				no	103
PT4	Air quality		X	no	no	104
UR1	Supply/demand	X	X	yes	NA	105
UR2	Unroaded opp's		X	yes	yes	105
UR3	Noise		X	no	no	105
UR4	Who participates?		X	no	yes	105
UR5	Attachments		X	no	yes	105
UR6	Scenic integrity	X	X	yes	no	R2 add'n
RR1	Supply/demand	X	X	yes	NA	107
RR2	Roaded opp's		X	yes	no	107
RR3	Noise		X	no	no	107
RR4	Who participates?		X	no	no	107
RR5	Attachments		X	no	no	107
RR6	Scenic integrity	X	X	yes	yes	R2 add'n
RR7	Wilderness attributes	X	X	no	no	115
SI1	Road users		X	no	yes	N/A
SI2	Access		X	no	no	N/A
SI3	Road benefits		X	no	no	N/A
SI4	Sense of place		X	no	no	117
SI5	Road conflicts		X	no	no	N/A
CH1	Cultural		X	no	no	112
CH2	Treaty rights		X	no	no	112
CH3	Historic		X	no	no	113
CR1	Civil rights		X	no	no	118

Questions and R2 Guidance

Two levels of analysis are discussed below. The forest plan direction is used for forest plan revisions and amendments. The subforest-scale direction is used when doing landscape assessments or project planning. We encourage subforest-scale analysis be done on watersheds, as it can be used to make decisions on road construction, reconstruction, decommissioning, road restrictions, and the application of site-specific mitigation measures.

The key information and key analytical tools and information sources are those the team felt were most appropriate for answering the questions in R2. Three common information sources are used for answering most of the questions, GIS coverages, corporate database information, and for the subforest scale questions, information in current Forest Plans. These are not listed for each question unless a particular item is emphasized. **Appendix 1 (Misc. Report FS-643) may contain additional information appropriate for your analysis; we recommend you study the complete lists in that document.** It is very important that the ID Team document how each question was addressed or the reason it was not addressed. The ID Team's analysis process can be tracked using the Documentation Table located in the Appendix of this Roads Analysis package. Definitions have changed since the printing of FS-643. The new definitions are in the Appendix.



Aquatic, Riparian Zone, and Water Quality (AQ)

The subforest-scale analysis for all of the AQ questions is typically done on watersheds.

AQ (1): How and where does the road system modify the surface and subsurface hydrology of the area?

Forest plan scale: Road quantity and location are considered in determining watershed condition class and identifying sensitive watersheds. Condition Class II and III designations may be used in constraining Spectrum, management area allocations, or activities allowed and/or constrained in area or geographic area allocations.

Suggested information needs:

- ◆ GIS coverages including stream network, riparian and wetland delineations if available, road network including unclassified roads if available.

Suggested analytical tools and information sources:

- ◆ Inland West Water Initiative.
- ◆ Forest road atlas.

Subforest scale: This is a required component of watershed analysis.

Suggested information needs:

- ◆ Similar to forest plan scale with field validation of potential problems.
- ◆ Generally, it will not be necessary to gather information on road cut heights relative to soil depth.
- ◆ During road surveys, note any stream crossings or drainage ditches which are increasing the effective drainage density of the watershed and could potentially

increase peak flows and sediment delivery to the stream network. Note where roads intercept groundwater or are affecting groundwater-controlled ecosystems such as wetlands or sub irrigated patches of riparian vegetation.

- ◆ Map problem areas and describe specific mitigation measures, including separating Connected Disturbed Areas. Other mitigation measures include replacing problem culverts and installing road drainage structures closer to the crossing (disconnecting the ditch from the channel).

Key analytical tools and information sources:

- ◆ Inland West Water Initiative.
- ◆ Forest plan-scale information.
- ◆ Deferred maintenance road surveys.
- ◆ Water road interaction modules from San Dimas.
- ◆ Hydrologic Condition Assessment.

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AQ (2): How and where does the road system generate surface erosion?

Forest plan scale: Road location and soil type are considered in determining watershed condition class and identifying sensitive watersheds. Condition Class II and III designations may be used in constraining Spectrum, management area allocations, or activities allowed and/or constrained in area or geographic area allocations.

Key information needs:

- ◆ GIS coverage overlaying soils, road network, and stream network.

Key analytical tools and information sources:

- ◆ Inland West Water Initiative.
- ◆ Forest roads database.

Subforest scale: This is a required component of watershed analysis. Address the question of road system delivery of sediment to the stream system by analyzing Connected Disturbed Areas and describing measures being taken to decrease Connected Disturbed Areas (see answer to AQ1). The number of stream crossings is an indicator of potential sediment and water delivery.

Key information needs:

- ◆ Same information as forest plan scale.
- ◆ Adequacy of cross-drain spacing near stream areas, with consideration for soil types, road surfacing, and gradients.
- ◆ Efficiency of buffers or other sediment containment structures below cross-drains relative to the stream network.
- ◆ Number and the effect of Connected Disturbed Areas.
- ◆ Road design (inslope with ditch vs. outslope).
- ◆ Ditch erosion contributing to connected disturbed areas.

Key analytical tools and information sources:

- ◆ Forest plan-scale information.
- ◆ Deferred maintenance road surveys.
- ◆ Hydrologic Condition Assessment

AQ (3): How and where does the road system affect mass wasting?

Forest plan scale: Potential mass wasting areas are considered in determining watershed condition class and identifying sensitive watersheds. Large areas subject to mass wasting could affect access. This could affect a variety of items, such as land allocation and use and economics of timber harvest. Mass wasting is an issue in some areas in Region Two. Information about areas with mass wasting potential was incorporated into the IWWI geomorphic integrity rating.

Key information needs:

- ◆ GIS coverage of soils, geologic hazards (if available), and road network.

Key analytical tools and information sources:

- ◆ Inland West Water Initiative.

Subforest scale: This is a required component of watershed analysis. It may or may not be an issue depending on the geology, soils, and topography of the area.

Key information needs:

- ◆ Field reconnaissance to verify or identify areas of potential mass wasting.
- ◆ Location of mass wasting in the current road system.

Key analytical tools and information sources:

- ◆ Aerial photos.
- ◆ Deferred maintenance road surveys.
- ◆ Forest plan-scale information.
- ◆ State Department of Transportation.

AQ (4): How and where do road-stream crossings influence local stream channels and water quality?

Forest plan scale: Road location is considered in determining watershed condition class and identifying sensitive watersheds.

Key information needs:

- ◆ GIS coverages, stream network and road network including unclassified roads if available.

Key analytical tools and information sources:

- ◆ Inland West Water Initiative.

Subforest scale: Road location is considered in determining watershed condition class and identifying sensitive watersheds. This is a required component in watershed analysis.

Key information needs:

- ◆ GIS coverages, including stream network and road network (both classified and unclassified roads).
- ◆ Location of road-stream crossings affecting channel morphology.
- ◆ Quantity and effect of Connected Disturbed Areas.
- ◆ Type of road-stream crossing (i.e. culvert, bridge, ford) as related to channel type change or crossing blowout.
- ◆ Location of previous culvert failure or other road-stream crossing problem areas.

Key analytical tools and information sources:

- ◆ Stream survey/inventory
- ◆ Deferred maintenance road surveys.
- ◆ Forest plan-scale information.
- ◆ USGS or other stream gage information.

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AQ (5): How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides to enter surface waters? (R2 suggests considering road sanding also).

Forest plan scale: This is not a programmatic issue. Forests have hazardous spill checklists developed to deal with these events.

Subforest scale: This is a rare issue. This question will be addressed if raised during project scoping.

Key information needs:

- ◆ Identify high frequency hazardous material routes (i.e. highways).
- ◆ Identify roads which routinely have chemicals applied for surface stabilization or de-icing.
- ◆ Paved roads.

Key analytical tools and information sources:

- ◆ Hazardous waste plan.

AQ (6): How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as delivery of sediments, thermal increases, elevated peak flows)?

Forest plan scale: Road location is considered in determining watershed condition class and identifying sensitive watersheds. This is similar to questions 1-5 above and may already be adequately addressed in those questions.

Key information needs:

- ◆ See questions 1-5.

Key analytical tools and information sources:

- ♦ See questions 1-5.

Subforest scale: This is a required component in watershed analysis.

Key information needs:

- ♦ See questions 1-5.

Key analytical tools and information sources:

- ♦ See question 1-5.

AQ (7): What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants? *WP (2) is a similar question and it is suggested that these two questions be addressed together. WP (2): How does road development and use affect water quality in municipal watersheds. (R2 suggests adding to these questions the following, "Are there any streams in the area listed in the State 303(d) list or 305(b) report as impaired due to road-derived pollutants such as sediment?")*

Forest plan scale: Typically, this is a forest plan issue when dealing with municipal watersheds. It is suggested that at this scale, only qualitative issues be addressed. Broad changes in use and demand are identified in the forest plan analysis but usually not related to road pollutants.

Key information needs:

- ♦ Location of major water diversions
- ♦ State-designated beneficial uses.
- ♦ Location of state-listed streams [303(d) list] or any other state information regarding stream condition.
- ♦ Forest information on stream condition/health.
- ♦ Predicted population growth.

Key analytical tools and information sources:

- ♦ 305 (b) reports.
- ♦ 303 (d) list.
- ♦ State Demographer
- ♦ Forest monitoring reports on stream health and condition.
- ♦ County Comprehensive Plan.

Subforest scale: This is a required component in watershed analysis. Both qualitative and quantitative issues can be addressed at this scale.

Key information needs:

- ♦ Designated beneficial uses in the analysis area, by stream segment.
- ♦ Location of roads that are degrading designated beneficial uses.
- ♦ Information, from the state, regarding changes in uses and demand expected over time.

Key analytical tools and information sources:

- ◆ IWWI.
- ◆ Forest plan-scale information.

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AQ (8): How and where does the road system affect wetlands?

Forest plan scale: This is not a programmatic issue. Laws and regulations address this issue. Management direction also exists in the Water Conservation Practices (WCP) Handbook at the forest plan level. The forest plan EIS contains a general discussion of wetlands, but the discussion is usually not related to road effects.

Subforest scale: This is a required component in watershed analysis. It may or may not be an issue, depending on the presence and extent of wetlands.

Key information needs:

- ◆ Mapped locations of wetlands on or near existing or proposed roads.
- ◆ Documentation of any current road effects on wetlands.

Key analytical tools and information sources:

- ◆ Existing mitigation or management plans that address prevention or rehabilitation of adverse road effects on wetlands.

AQ (9): How does the road system alter physical channel dynamics, including isolation of floodplains; constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?

Forest plan scale: At a very general level, this is a programmatic issue. Management direction exists (WCP Handbook) at the forest plan level. The forest plan EIS contains a general discussion of channel dynamics. The effects of roads in proximity to streams are a component in the IWWI.

Key information needs:

- ◆ GIS analysis of road proximity to streams and road-stream crossings.

Subforest scale: This is a required component in watershed analysis.

Key information needs:

- ◆ Field verification of information obtained at forest plan scale.
- ◆ Locations of floodplain encroachment, channel constriction, sediment accumulation, and change in channel type.

Key analytical tools and information sources:

- ◆ Forest plan-level information.
- ◆ Rosgen stream classification.

AQ (10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?
(R2: i.e., fish and amphibians)

Forest plan scale: Forest plan analysis identifies species distributions. WCP standard, 12.2 (4), protects migration and movement of these species. The forest plan EIS contains a general discussion of aquatic organisms, but the discussion is usually not related to road effects.

Subforest scale: This is a required component in watershed analysis. It may or may not be an issue depending on site-specific conditions. In some instances, migration barriers are desirable to protect TES species.

Key information needs:

- ◆ Identify aquatic species present and their relationship to roads in the riparian areas and road-stream crossings.
- ◆ Identify reaches in which roads in riparian areas or road-stream crossings are issues, and identify potential problems based on area-specific species.

Key analytical tools and information sources:

- ◆ See key information needs above.

AQ (11): How does the road system affect shading, litterfall, and riparian plant communities?

Forest plan scale: This is not a programmatic issue. The Water Conservation Practices Handbook contains management direction.

Subforest scale: This is a required component in watershed analysis. It may or may not be an issue depending on site-specific conditions.

Key information needs:

- ◆ Location of roads relative to riparian areas and effects on the riparian community.
- ◆ Location of stream reaches where temperature is a concern.

Key analytical tools and information sources:

- ◆ Forest plan-scale information - GIS overlays of road network and stream network or riparian areas.

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AQ (12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

Forest plan scale: Forest plan analysis identifies species distributions. The biological evaluation may address direct habitat loss for at-risk species but will not usually address fishing and poaching. The WCP Handbook addresses direct habitat loss. Fishing and poaching may be addressed at the subforest scale.

Subforest scale: This question will be addressed in all Biological Evaluation/Biological Assessment analysis. It may or may not be an issue depending on the presence of at-risk aquatic species.

Key information needs:

- ◆ Location of roads and stream network containing at-risk species.
 - Locations of habitat loss due to roads.
 - Location of habitat relative to proposed roads.
- ◆ Known areas where there is poaching due to access.

Key analytical tools and information sources:

- ◆ Forest Plan Biological Evaluation (BE).
- ◆ Consult federal and state wildlife agencies.

AQ (13): How and where does the road system facilitate the introduction of non-native aquatic species? (*R2 – remember plants, mollusks, etc.*)

Forest plan scale: This is not a programmatic issue.

Subforest scale: This is an emerging issue. This question will be addressed if raised during project scoping.

Key information needs:

- ◆ Location of fish stocking sites.
- ◆ State and local stocking policies.
- ◆ Locations invaded by non-native aquatic species, if available and pertinent.

Key analytical tools and information sources:

- ◆ Contact federal and state fish and wildlife departments.
- ◆ State Department of Agriculture.

AQ (14): To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique aquatic species or species of interest?

Forest plan scale: Forest plan BE identifies species distributions. Exceptionally high aquatic diversity or productivity areas may be a factor in management area allocation (for example, Special Interest Areas or special area designations). Standards and guidelines affecting road management may be associated with these areas.

Key information needs:

- ◆ GIS analysis: IWWI high-value segments overlaid with the road network.

Key analytical tools and information sources:

- ◆ Forest plan revision fine filter assessment identifies preliminary Conservation Planning Areas.
- ◆ Inland West Water Initiative.
- ◆ Federal and state wildlife departments

Subforest scale: This question will be addressed in all Biological Evaluation/Biological Assessment analysis. It may or may not be an issue depending on site-specific conditions.

Key information needs:

- ◆ Field validation of Inland West Water Initiative-listed, high-value segments for fisheries.
- ◆ Location of stream reaches bordering known amphibian habitat.

Key analytical tools and information sources:

- ◆ Forest plan Biological Evaluations.
- ◆ Inland West Water Initiative.
- ◆ Federal and state wildlife departments.

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Terrestrial Wildlife (TW)

TW (1): What are direct effects of the road system on terrestrial species habitat? (*R2 suggests changing this question to “What are the direct and indirect effects of the road system on terrestrial species habitat.”*)

Forest plan scale: Loss of habitat and/or connectivity are addressed in forest plan analysis. Forest plan standards and guidelines can be included to protect these attributes.

Key information needs:

- ◆ Identification of wildlife species affected by created openings and edge.
- ◆ GIS coverages that include cover type, structural stage, road network including maintenance levels, wildlife layers including travel corridors and areas of restricted use.
- ◆ Wildlife habitat relationships for species such as elk, deer, raptors, American marten, lynx, and interior forest wildlife.

Key analytical tools and information sources:

- ◆ Scientific literature for above species.
- ◆ Wildlife habitat relationship models.
- ◆ Consult with other wildlife agencies.

Subforest scale: Negative edge effects are addressed in subforest-scale analysis.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

TW (2): How does the road system facilitate human activities that affect habitat?

Forest plan scale: Forest plan EIS analyzes the effect of road-related activities. Habitat effectiveness modeling will be the key tool. There will likely be standards and guidelines to provide for the habitat needs in the forest plan. Other specific effects include an increase in edge habitat and access for fire equipment.

Key information needs:

- ◆ GIS coverages that include cover type, structural stage, road network including maintenance levels, wildlife layers including travel corridors and areas of restricted use.
- ◆ Fuelwood collection patterns (i.e. opened and closed areas).
- ◆ Linkage of road network and timber harvest schedules.
- ◆ Wildlife habitat management needs (e.g. prescribed burns, aspen regeneration, noncommercial thinning from below).
- ◆ Wildlife security areas.
- ◆ Recreational uses, type, season, and amount.

Key analytical tools and information sources:

- ◆ Five-year timber harvest schedule.
- ◆ Wildlife habitat relationship models.
- ◆ Consult with other wildlife agencies.

Subforest scale: This question is addressed in all subforest-scale analysis.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

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TW (3): How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the effects on wildlife species? (*R2 suggests the second question be changed to "What are the direct and indirect effects on wildlife species?"*)

Forest plan scale: Forest plan EIS analyzes the effect of road-related activities.

General patterns of game harvest are a useful index of human activities. Harassment, poaching, and road kills can only be estimated in terms of open road densities at the forest level. Illegal activities are more appropriately addressed at the subforest scale.

Key information needs:

- ◆ Game harvest levels by state-designated hunt area (area).
- ◆ Open road densities and public use.
- ◆ Areas that function as security during hunting seasons.
- ◆ Poaching patterns, if any.
- ◆ Recreational uses, type, season and amount.

Key analytical tools and information sources:

- ◆ GIS coverages that include cover type, structural stage, road network including maintenance levels, wildlife layers including travel corridors and areas of restricted use.
- ◆ Consult with other wildlife agencies.
- ◆ Table 1-5 in FS-643.

Subforest scale: Typically, legal and illegal harvest activities are addressed at the subforest scale in cooperation with state wildlife agencies.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

TW (4): How does the road system directly affect unique communities or special features in the area?

Forest plan scale: This question is addressed in forest plan analysis. Forest plan analysis identifies unique communities or special features at the higher level (ecoregion level if information is available).

Key information needs:

- ◆ Spatial location of unique communities and special features.
- ◆ Description of unique communities and special features.
- ◆ Road system in relation to communities and special features.
- ◆ Human access and potential impacts to unique communities and special features.
- ◆ The effect of the road system on wetlands (see AQ8).
- ◆ List of potential impacts from road system on specific communities.
- ◆ Potential conflicts between road use and special features (e.g., peregrine falcon eyre).

Key analytical tools and information sources:

- ◆ GIS coverage of unique communities and special features.
- ◆ GIS coverage of road network.
- ◆ GIS DEM layer for line-of-sight analysis, drainage patterns, etc.
- ◆ GIS coverage of wetland communities.

Subforest scale: This question is addressed in all subforest-scale analysis. It may or may not be an issue depending on site-specific conditions.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

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Ecosystem Functions and Processes (EF)

EF (1): What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

Forest plan scale: This question is addressed in forest plan analysis. Forest plan ecosystem assessments identify unique or vulnerable ecological attributes at the eco-province and eco-section levels. Information about species occurrence and TES concentration areas is also needed. Therefore, both ecosystem and species assessments are required. The information used and associated analyses are closely related to determinations of population viability.

Key information needs:

- ◆ Maps and data generated from eco-province and eco-section assessments.
- ◆ Maps and data reflecting distributions or known occurrences of sensitive or emphasis species.
- ◆ Information generated from species assessments, including impacts of roads on species.
- ◆ List of TES species and associated habitats.
- ◆ Roadless and unroaded area inventories.
- ◆ Forest vegetation maps reflecting cover type, successional stage, and structural condition.
- ◆ Maps and descriptions of unique habitats (e.g. fens, old-growth forests, caves, cliffs, etc).
- ◆ Assessment of the effects or impacts of roads on unique habitats.
- ◆ Soil maps.
- ◆ Historic Range of Variability assessment.

Key analytical tools and information sources:

- ◆ Eco-province and eco-section wide vegetation data.
- ◆ GAP data.
- ◆ AVHRR vegetation data.
- ◆ Assessment products and tools generated by Species Conservation Project.
- ◆ Terrestrial Ecosystem Landscape Characterization and Historic Range of Variation Assessments.
- ◆ Scientific literature.

Subforest scale: This question is addressed in all subforest-scale analysis in currently unroaded areas. It may or may not be an issue depending on site-specific conditions.

Key information needs:

Generally, the information needs are available and used for subforest analysis. Subforest analyses will identify specific unique attributes.

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Forest Plan and associated assessments.
- ◆ Landscape or watershed assessments.
- ◆ Assessment products and tools generated by Species Conservation Project.
- ◆ Terrestrial Ecosystem Landscape Characterization and Historic Range of Variation Assessments.
- ◆ Scientific literature.

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EF (2): To what degree does the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

Forest plan scale: Exotic species are addressed in general terms during forest plan analysis. The presence of, trends in, and programs to treat exotic plants and animals are analyzed in the forest plan, although the effect of roads is only analyzed in a programmatic context.

Key information needs:

Programmatic level analysis associated with forest planning usually does not deal with specific route locations. Allocations of areas to motorized or non-motorized uses will address the general effects to plant and animal communities. Effects of existing route locations (including effects on plant and animal communities) are addressed in the appropriate sections of the EIS. A local Forest issue or concern might require a more detailed level of discussion or analysis. This would, however, still be discussed in a programmatic context. Accordingly, most of the information needs and sources listed are not appropriate at the forest plan level except where a local issue might exist. Important information for the usual programmatic forest plan analysis includes the following:

- ◆ Catalog of known noxious weeds expected in area.
- ◆ Catalog of known problem exotic diseases, predators, parasites found in area.

Key analytical tools and information sources:

Most tools and sources listed are too site-specific for forest plan analysis. Those that are applicable include the following:

- ◆ Lists (inventories) of exotic species and literature reviews would be useful to include as appendix information or citations in forest planning administrative record.

Subforest scale: This may or may not be an issue depending on site-specific conditions.

Key information needs:

The information compiled in the programmatic level analysis for the forest plan should be utilized to the greatest extent possible. In addition, inventory and site specific data should be utilized.

- ◆ Map of existing road network.
- ◆ Locations and maps of know exotic species, disease, predator, and parasite strongholds.
- ◆ Locations and maps of know strongholds of plants and animals at risk by introduction of exotic species, diseases, predators, and parasites.
- ◆ Maps and data reflecting distributions or known occurrences of sensitive or emphasis species.
- ◆ Forest Plan and associated assessments (see items listed for forest plan scale).

Key analytical tools and information sources:

Where exotics and associated effects are an issue, the list of potential tools and information sources should be considered.

- ◆ Lists (inventories) of exotic species and literature reviews.
- ◆ Synthesis of literature.

EF (3): To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Note: This question should be addressed in concert with EF(4). See discussion below.

EF (4): How does the road system affect ecological disturbance regimes in the area?

Note: This question should be addressed in concert with EF(3).

Forest plan scale: Forest plan analysis identifies broad ecological disturbance regimes, access concerns, the potential for roads to increase the initiation of disturbance events, and the potential for roads to serve as disturbance vectors.

Key information needs:

Fire frequency and severity are addressed through the Historical or Natural Range of Variation (HRV or RNV) assessment. This assessment (HRV) should be done irrespective of revision schedules. Information needed to fully address this question and EF(3) should not be limited only to fire disturbance. Insect, disease, climatic, and physical disturbance should also be addressed. In many Rocky Mountain ecosystems, these disturbance factors exert a greater influence than fire. Information pertaining to all disturbances should be included in HRV assessment. See list for EF(3) in Misc. Report FS-643.

- ◆ Historic Range of Variability (includes fire and insect/disease frequencies).
- ◆ Historical fire data.
- ◆ Fire regime, condition class, and risk maps.
- ◆ Maps of fire occurrence and extent.
- ◆ Historical insect and disease data.
- ◆ Insect and disease risk inventories.

- ◆ Forest vegetation maps reflecting cover type, successional stage, and structural condition.
- ◆ Maps and information generated from eco-province and eco-section ecosystem assessments.

Key analytical tools and information sources:

- ◆ Landscape models, fire simulation models.
- ◆ Strategic forest planning model, such as Spectrum.
- ◆ Silvicultural models (Forest Vegetation Simulator).
- ◆ Insect and disease risk models.
- ◆ Appropriate state agencies.
- ◆ Terrestrial Ecosystem Landscape Characterization and Historic Range of Variation Assessments.

Subforest scale: This may or may not be an issue depending on site-specific conditions.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

EF (5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

Forest plan scale: This is not a programmatic issue.

Subforest scale: This is a rare issue. This question will be addressed if raised during project scoping. Effects to wildlife are addressed in the TW questions. Although noise level itself is a rare issue, general disturbance factors (including noise) associated with expected recreation are addressed through the Recreation Opportunity Spectrum (ROS).

Key information needs:

- ◆ Expected traffic levels.
- ◆ Type of traffic and project length.

Key analytical tools and information sources:

- ◆ Engineering reports, traffic counters, maintenance schedules.

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Economics (EC)

EC (1): How does the road system affect the Agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

Forest plan scale: At the Forest Plan scale, there are three categories roads could be placed in. These categories are:

1. Roads that will always be kept open for obvious reasons. These would be roads connecting communities, major recreation areas, etc. Most of the questions would need to be addressed to identify any resource concerns for these roads. However, the economic questions would not be necessary at this scale.
2. Roads that will be closed due serious resource damage or annual budgetary constraints. It would be appropriate to use the questions to identify the issues with the individual roads but an economic analysis is not warranted.
3. The third category is perhaps the largest. These are roads that do not fall into either of the first two categories. The questions would need to be addressed for these roads. However, the economic questions are again not appropriate at this scale. If economic issues are important to the Forest Leadership Team, consult with the Regional Economist for advice on conducting these analyses.

Documentation of the above categorization is key. This can help prioritize opportunities as funding becomes available.

Subforest scale: The forest plan financial PNV analysis considers costs and revenues affecting management area allocations and projected outputs. At the subforest-scale this is considered as part of an individual project economic analysis. An analysis comparing the "no action" with all identified options is necessary to isolate financial effects associated with identified roads.

Key information needs:

- ◆ Road costs - survey and design, construction and reconstruction, contract administration, operation and maintenance.
- ◆ Associated costs – non-road costs that would occur only if the road occurred.
- ◆ Associated revenues - all revenues (cash and in-kind) from the sale, permit, or lease of forest goods and services associated with the roads identified above.

Key analytical tools:

- ◆ Quick-Silver (preferred) or Excel spreadsheets. If Quick-Silver is used, it can be designed to answer all of EC 1 and 2 and part of 3.

Key information sources:

- ◆ TSPIRS TPIR 01 (column 3 only) – found in NRIS-HD module.
- ◆ R2 annual economic values – found in the R2 "system file" at <http://fsweb.nc.fs.fed.us/nris/qsilver/dloads.html>
- ◆ Forest-wide engineering records.
- ◆ FFIS reports.

EC (2): How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

Forest plan scale: See categorization advice under EC(1). No further analysis is needed.

Subforest scale: This is considered in subforest-scale as part of an individual project economic analysis. A with-and-without analysis is necessary to isolate priced economic effects associated with identified roads. Where a quantitative analysis is possible, an analysis comparing the “no action” with all identified options is necessary to isolate non-priced economic effects associated with identified roads.

Priced consequences are included in forest plan economic PNV analysis affecting management area allocations and projected outputs. Non-priced consequences are addressed in either quantitative or qualitative terms throughout the forest plan EIS.

Key information needs:

- ◆ Road costs - survey and design, construction and reconstruction, contract administration, operation and maintenance.
- ◆ Associated costs - non-road costs that would occur only if the road occurred.
- ◆ Associated benefits - all benefits from the provision of forest goods and services associated with the roads identified above.

Key analytical tools:

- ◆ Quick-Silver (preferred) or Excel spreadsheets for priced consequences, tables and narratives only for non-priced consequences. If Quick-Silver is used, it can be designed to answer all of EC 1 and 2 and part of 3.

Key information sources:

- ◆ Same as for EC(1).

EC (3): How does the road system affect the distribution of benefits and costs among affected people?

Forest plan scale: See categorization advice under EC(1). No further analysis is needed.

Subforest scale: This will be considered as part of a landscape scale analysis. Consult with the Regional Economist for advice specific to the landscape scale analysis. This question usually is not appropriate at the individual project scale.

Key information needs:

- ◆ For jobs and income, see details in the Forest Economic Analysis Tool Spreadsheet (FEAST).

Key analytical tools:

- ◆ For jobs and income, use Forest Economic Analysis Tool Spreadsheet (FEAST).

Key information sources:

- ◆ Resource specialists will need to determine relevant partners.
- ◆ For jobs and income, see details in the Forest Economic Analysis Tool Spreadsheet (FEAST).

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Commodity Production

Note: Address questions TM(2) and TM(3) before TM(1).

TM (2) and TM (3): How does the road system affect managing the suitable timber base and other lands?
How does the road system affect access to timber stands needing silvicultural treatment?

Forest plan scale: This is a forest plan issue but is limited to arterial and collector roads only.

Key information needs:

- ◆ Forest plan management area prescription allocations.
- ◆ Existing road system.
- ◆ Frequency of entry for all timber management purposes.
- ◆ Suitable timber lands.
- ◆ Tentatively suitable timber lands where timber management may be needed to meet desired future condition.

Key analytical tools and information sources:

- ◆ GIS coverages and associated data, aerial photos, Digital Elevation Models, and ground-truthing.
- ◆ Forest roads atlas.
- ◆ Silvicultural models (Forest Vegetation Simulator).
- ◆ Harvest scheduling models such as Spectrum.

Subforest scale: This is an issue to be addressed in all subforest-scale analyses if the area includes suitable timber lands or lands where vegetation management is needed to meet desired future condition.

Key information needs:

- ◆ Forest plan management area prescription allocations.
- ◆ Existing road system.
- ◆ Frequency of entry for all timber management purposes.
- ◆ Suitable timber lands.
- ◆ Tentatively suitable timber lands where timber management may be needed to meet desired future condition.
- ◆ Service life of roads (temporary vs. permanent).

Key analytical tools and information sources:

- ◆ GIS coverages and associated data, aerial photos, DEMs, and ground truthing.
- ◆ Forest roads atlas.
- ◆ Harvest area plans.
- ◆ Silvicultural models (Forest Vegetation Simulator).
- ◆ Harvest scheduling models such as Spectrum.
- ◆ Fire Management Plan.

TM (1): How does the road spacing and location affect logging system feasibility?

Forest plan scale: Used in economic efficiency analysis for determining timber suitability and thus management area allocations.

Key information needs:

- ◆ Transportation plan.
- ◆ Corporate databases.

Key analytical tools and information sources:

- ◆ Timber suitability and capability analysis located on the R2 web site.

Subforest scale: This is an issue to be addressed in all subforest-scale analyses if the area includes suitable timber lands or lands where vegetation management is needed to meet desired future condition.

Key information needs:

- ◆ The results of answering question TM(2)/TM(3).
- ◆ Existing road system.
- ◆ Slope Class.
- ◆ Slope Deflection.
- ◆ Logging system.
- ◆ Landing location and design.
- ◆ Average log size.
- ◆ Harvest unit location and silvicultural prescription.
- ◆ Activity fuels prescription
- ◆ Management area objectives and desired conditions

Key analytical tools and information sources:

- ◆ The results of answering question TM(2)/TM(3).
- ◆ Logging system and scheduling models such as SNAP III, MAGIS, SIMPLEE.
- ◆ Terrain profiles.
- ◆ Logging and transportation system software, such as LOGGERPC, HELIPACE, FORWARDER.

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MM (1): How does the road system affect access to locatable, leasable, and salable minerals?

Forest plan scale: Forest plan analysis identifies lands available for locatable, leasable, saleable minerals as well as current use. Laws and regulations address access issues.

Key information needs:

- ◆ Oil and gas leasing decisions and stipulations.
- ◆ Leaseable, locatable, saleable production potential.
- ◆ Existing road system.
- ◆ Areas available for locatable and saleable minerals.
- ◆ Areas currently under lease.
- ◆ Motorized and nonmotorized areas

Key analytical tools and information sources:

- ◆ GIS coverages and associated data on current uses and agreements.
- ◆ Oil and gas leasing analysis.
- ◆ Forest roads atlas, special use permits, etc.

Subforest scale: This is an issue to be addressed in all subforest-scale analyses if the area includes lands where minerals management is allowed and current leases or potential for leasing exists.

Key information needs:

- ◆ Forest plan land management area prescription allocation.
- ◆ Oil and gas leasing stipulations.
- ◆ Oil and gas development potential.
- ◆ Existing road system.
- ◆ Areas available to locatable and salable minerals development (i.e., not withdrawn).
- ◆ Areas currently under lease.
- ◆ Historic mineral activity.
- ◆ Service life of roads (temporary vs. permanent).

Key analytical tools and information sources:

- ◆ Oil and gas leasing analysis.
- ◆ Lease records.
- ◆ Forest roads atlas.
- ◆ Oil and gas lease conditions.
- ◆ Mining operations and reclamation plans.
- ◆ USGS data or reports, 2800 Files, State Geologic reports.
- ◆ Network analysis software "NETWORK II" or "AV ROUTES."

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RM (1): How does the road system affect access to range allotments? *(R2 suggests rewording this question to be "How does the road system affect rangeland management?" This rewording encompasses the entire situation including issues such as gates left open, funding and maintaining cattle guards, need for increased fencing, creation of travel routes for livestock, increased public access and issues with that, etc.)*

Forest plan scale: This is not normally a programmatic issue unless administrative access to allotments is restricted through designation of nonmotorized management areas at the Forest Plan level.

Key information needs:

- ◆ Allotment boundaries.
- ◆ Individual resource-based management objectives (i.e. Riparian Area Improvement, etc.).
- ◆ Ground inventories identifying resource needs and management opportunities.
- ◆ List of range management objectives requiring or facilitated by roads.
- ◆ Location of constructed range improvements.
- ◆ Identification of roads critical to range management objectives.
- ◆ Operation of Permit (season of use, restriction of activities).

Key analytical tools and information sources:

- ◆ Permittee involvement.
- ◆ Allotment Management Plans.
- ◆ Permits.
- ◆ Annual Operating Instructions.

Subforest scale: This is an issue to be addressed in all subforest-scale analyses that affect areas with range allotments.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

WP (1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

Forest plan scale: This is not normally a programmatic issue unless access to water facilities would be affected by a nonmotorized management area prescription.

Key information needs:

- ◆ Existence of facilities.
- ◆ Legal access needed to operate and maintain facilities.

Key analytical tools and information sources:

If necessary to be addressed programmatically, use the following:

- ◆ NRIS water module – water use tracking system.
- ◆ Special Use Data System (SUDS).
- ◆ District knowledge.
- ◆ Aerial photos.
- ◆ State water rights database.

Subforest scale: This is an issue to be addressed in all subforest-scale analysis if access to water facilities would be affected.

Key information needs:

- ◆ Location of constructed improvements.
- ◆ Existing rights and priority.
- ◆ Landscape and watershed assessments

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

WP (2): How does road development and use affect the water quality in municipal watersheds?

This question is inherent within AQ(7). It will be answered there.

WP (3): How does the road system affect access to hydroelectric power generation?

Forest plan scale: This is not normally a programmatic issue unless access to hydroelectric power generation facilities would be affected by a nonmotorized management area prescription.

Key information needs:

- ◆ Existence of facilities.
- ◆ Legal access needed to operate and maintain the facilities.

Key analytical tools and information sources:

If necessary to be addressed programmatically, use the following:

- ◆ NRIS water module – water use tracking system.
- ◆ State water rights database.
- ◆ Special Use Data System (SUDS).

Subforest scale: This is an issue to be addressed in all subforest-scale analysis if access to hydroelectric power generation facilities would be affected. (Federal Energy Regulatory Commission may take precedence).

Key information needs:

- ◆ Location of constructed improvements.
- ◆ Existing rights and priority.
- ◆ Existence of the facility.
- ◆ Need for access.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

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SP (1): How does the road system affect access for collecting special forest products?

Forest plan scale: This is not normally a programmatic issue unless it is raised as an issue and access for collecting special forest products would be affected by a nonmotorized management area prescription.

Key information needs:

- ◆ Land allocations.
- ◆ Restrictions to access.
- ◆ Local community and tribal information related to industry and usage of special products.
- ◆ Locations of special forest products.

Key analytical tools and information sources:

- ◆ Public scoping

Subforest scale: This is a rare issue. This question will be addressed if raised during project scoping.

Key information needs:

- ◆ Land allocations.
- ◆ Restrictions to access.
- ◆ Local community and tribal information related to industry and usage of special products.
- ◆ Locations of special forest products.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Public scoping

SU (1): How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?

Forest plan scale: Forest plan analysis identifies lands used or available for communication sites, utility corridors and developed recreation sites. Plans also may contain criteria for authorization of access to private lands found within the boundaries.

Key information needs:

- ◆ Land allocations.
- ◆ Restrictions to access.
- ◆ Location of constructed improvements.
- ◆ Location of identified utility corridors (Western Utility Group Study).
- ◆ Existence of a facility or an authorized use.
- ◆ Need for communication site and access to site.
- ◆ Existing rights.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Land Ownership Status information (or Automated Lands Project).
- ◆ 1993 Utility Corridor Study by Western Utility Group.
- ◆ Aerial Photos.
- ◆ Special Use Data System (SUDS).
- ◆ District knowledge.
- ◆ 36 CFR 251, ANICLA and Telecommunications Act.

Subforest scale: This is an issue to be addressed in all subforest-scale analysis if access to these sites would be affected or access to private land is requested.

Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.



General Public Transportation (GT)

GT (1): How does the road system connect to public roads and provide primary access to communities?

Forest plan scale: Primary focus will be on National Forest arterial and collector roads, which provide the majority of public access. Coordinate transportation plans with other affected road management agencies.

Key information needs:

- ◆ Specific community traffic data and characteristics.
- ◆ Knowledge of communities and their access needs.
- ◆ Transportation plans from other road management agencies.

Key analytical tools and information sources:

- ◆ Origin – Destination studies.
- ◆ State Transportation Improvement Plan (STIP) - State Department of Transportation (SDOT).
- ◆ Transportation plans – Counties, tribes, and other federal agencies.
- ◆ Forest road atlas.

Subforest scale: This is considered at the subforest scale when National Forest roads provide access to communities or connections to other public roads. This will be specific to community needs in the area being studied. This scale analysis should include minor collector and local roads.

Key information needs:

- ◆ Transportation plans from other road management agencies.

Key analytical tools and information sources:

- ◆ State Transportation Improvement Plan (STIP) – State Department of Transportation (SDOT).
- ◆ Transportation plans – Counties, tribes, and other federal agencies.
- ◆ Forest road atlas.

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GT (2): How does the road system connect large blocks of land in other ownership to public roads (ad-hoc communities, subdivisions, inholdings, and so on)?

Note: When resident and community use constitutes a high percentage of traffic distribution, the Forest Service manual recommends non-agency jurisdiction on major roads. This could be a possible recommendation.

Forest plan scale: Primary focus will be on National Forest arterial and collector roads, which provide the majority of public access. Coordinate transportation plans with other affected agencies.

Key information needs:

- ◆ Knowledge of communities and their access needs should be incorporated into the road strategy and land allocations of the plan.
- ◆ Affected people needing access to in-holdings.
- ◆ Land-use and transportation plans of affected tribal and other federal agencies.
- ◆ Other public road funding sources for these access routes.
- ◆ Legal rights-of-way across agency lands.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Rights-of-way plats and agreements.
- ◆ Status atlas, Automated Land Project (ALP).
- ◆ Community and private plans and growth/development projections.
- ◆ Interagency agreements and land-use plans.
- ◆ State Transportation Improvement Plan (STIP) – SDOT.
- ◆ Special Uses Data System (SUDS)

Subforest scale: This is considered at the subforest scale, in general terms, as part of access to communities and in-holdings. Information listed will be specific to community needs in the area being studied. This scale analysis should include minor collector and local roads.

Key information needs:

- ◆ If a community preference assessment is unavailable, local growth or zoning plans may provide similar information.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Rights-of-way plats and agreements.
- ◆ Special Uses Data System (SUDS)

GT (3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, Department of Transportation easements)?

Forest plan scale: Identify roads that have shared ownership, right-of-way agreements, or legal obligations. Laws and regulations address access. Standards and guidelines exist; additional standards and guidelines can be developed to deal with this question.

Key information needs:

- ◆ Existence of a legal right by others across National Forest System lands.

Key analytical tools and information sources:

- ◆ Status atlas, ALP.
- ◆ Courthouse records.
- ◆ Office of General Counsel (OGC) confirmed rights.
- ◆ Special Uses Data System (SUDS)

Subforest scale: Identify roads that have shared ownership, right-of-way agreements, or legal obligations.

Key information needs:

- ◆ Existence of a legal right by others across National Forest lands.
- ◆ Terms and conditions of easements.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Status atlases, ALP.
- ◆ Courthouse records.
- ◆ OGC confirmed rights.
- ◆ Special Uses Data System (SUDS)

GT (4): How does the road system address the safety of road users?

Forest plan scale: This is not a programmatic issue. This is addressed in the forest plan standards and guidelines.

Subforest scale: This is considered at the subforest scale when raised as a specific issue during project scoping.

Key information needs:

- ◆ Specific community traffic, hazardous sites, and accident data.
- ◆ Road condition survey.
- ◆ Road Management Objectives.

Key Analytical tools and information sources:

- ◆ Traffic studies.
- ◆ Forest road atlas.
- ◆ Deferred maintenance data.
- ◆ Law Enforcement Investigation Management Attainment Reporting System.
- ◆ Special Uses Data System (SUDS)
- ◆ Status Atlases, ALP

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Administrative Use (AU)

AU (1): How does the road system affect access needed for research, inventory, and monitoring?

Forest plan scale: Generally, the location of research, inventory, and monitoring plots is too fine a scale for forest planning unless identified as an issue during scoping. Designated research areas are the exception.

Key information needs:

- ◆ Location and activities of long-term studies and location of designated research or monitoring areas.

Key analytical tools and information sources:

- ◆ Research plans (including area restrictions).
- ◆ Management area prescriptions and research activities scheduled.
- ◆ Forest road atlas.

Subforest scale: This is an issue to be addressed in all subforest-scale analysis if access to these sites is required.

Key information needs:

- ◆ Cost efficiency of roaded access for projected inventory and monitoring needs.
- ◆ Critical vehicle needs.

Key analytical tools and information sources:

- ◆ Local district knowledge.

AU (2): How does the road system affect investigative or enforcement activities?

Forest plan scale: Road use restrictions may be an issue at the forest plan scale.

Key information needs:

- ◆ Data from accident and violation investigations that could influence recommendations for road decommissioning or reconstruction.
- ◆ Road Management Objectives.
- ◆ Miles of open and closed roads.
- ◆ Data from other types of violations – area and frequency.

Key analytical tools and information sources:

- ◆ Forest road atlas.
- ◆ Forest law enforcement plan.
- ◆ Associated law enforcement with each subpart B closure order.
- ◆ Law Enforcement Management Attainment Reporting System.

Subforest scale: This question will be addressed if raised during project scoping.

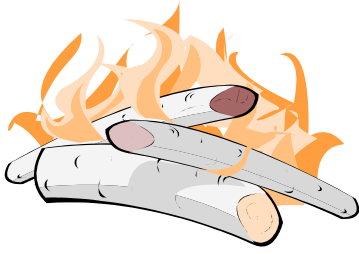
Key information needs:

- ◆ Same as forest plan scale.

Key analytical tools and information sources:

- ◆ Same as forest plan scale.

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Protection (PT)

PT (1): How does the road system affect fuels management?

Forest plan scale: Forest plan analysis identifies fuels objectives based on ecological conditions and management direction.

Key information needs:

The forest plan, associated EIS, and analysis should consider and provide direction for both wildland and management-ignited fire. The analysis should be an integrated effort considering management direction, ecological conditions and trends, and current and projected fuel conditions.

- ◆ Historic Range of Variability (includes fire frequencies).
- ◆ Historical fire data.
- ◆ Forest vegetation maps.
- ◆ Coarse filter assessment.
- ◆ Fine filter assessment.
- ◆ Existing road system.
- ◆ Fuel types and loading.
- ◆ Level of activity fuels.
- ◆ Road closure devices – location and type.
- ◆ Area restrictions.

Key analytical tools and information sources:

- ◆ Strategic forest planning models, such as Spectrum.
- ◆ GIS fire layers and analysis.
- ◆ Forest Vegetation Simulator.
- ◆ Forest road atlas.
- ◆ Insect and disease risk models.
- ◆ Fire models.

Subforest scale: This is an issue to be addressed in all subforest-scale analysis dealing with fuel management treatments.

Key information needs:

- ◆ Fine filter assessment.
- ◆ Existing road system.
- ◆ Fuel types and loading.
- ◆ Expected level of activity fuels.
- ◆ Forest plan direction.
- ◆ Cost/benefits of road use in fire management objectives.

- ◆ Area restrictions.
- ◆ Road closure devices – location and type.

Key analytical tools and information sources:

- ◆ GIS fire layers and analysis.
- ◆ Forest Vegetation Simulator.
- ◆ Forest road atlas.
- ◆ Insect and disease risk models.
- ◆ Fire models.

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PT (2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

Forest plan scale: This is not normally a programmatic issue.

Subforest scale: This is an issue to be addressed in subforest-scale analysis if raised during project scoping.

Key information needs:

- ◆ Existing road system.
- ◆ Travel restrictions.
- ◆ Location of fire-risk hazards.
- ◆ Type of firefighting equipment to be used.
- ◆ Location of wildland/urban interface areas.
- ◆ Critical design of vehicles for roads.
- ◆ Maximum bridge loading.

Key analytical tools and information sources:

- ◆ Aerial photos.
- ◆ Risk assessment.

PT (3): How does the road system affect risk to fire fighters and to public safety?

Forest plan scale: This is not normally a programmatic issue.

Subforest scale: This is an issue to be addressed in subforest-scale analysis if raised during project scoping.

Key information needs:

- ♦ Existing road system.
- ♦ Fuel types and loading.
- ♦ Level of activity fuels.
- ♦ Road use restrictions.
- ♦ Topographic features.
- ♦ Cost/benefits of road use in fire management objectives.

Key analytical tools and information sources:

- ♦ NFMAS.
- ♦ GIS Analysis.
- ♦ FARSITE.

PT (4): How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Forest plan scale: This is included in forest plan analysis in general terms.

Key information needs:

- ♦ *Guidance for Incorporating Air Resource Information into Forest Planning Documents for National Forests in Wyoming* - Regional Office Publication by Blett and Manieros

Subforest scale: This is considered at the subforest scale in general terms. It is specifically addressed if raised as an issue during project scoping.

Key information needs:

- ♦ *A Desk Reference for NEPA Air Quality Analysis*. 1995. Available from Janice Peterson, U.S.D.A. Forest Service, R6.

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Recreation



R2 suggests answering the contrasting Unroaded Recreation (UR) and Road-related Recreation (RR) questions in combination as listed below. In addition, R2 suggests using the terminology Motorized Recreation for RR and Non-motorized recreation for UR.

Unroaded Recreation (UR) and Road-related Recreation (RR).

(R2 suggests this is non-motorized recreation and motorized recreation).

UR & RR (1): Is there now or will there be in the future excess supply or excess demand for unroaded* recreation opportunities? Is there now or will there be in the future excess supply or excess demand for roaded* recreation opportunities? * Unroaded = non-motorized; roaded = motorized. *(R2 suggests rewording these questions to “What are the supply and demand relationships for unroaded and/or roaded recreation opportunities?”)*

Forest plan scale: This is included in forest plan analysis. Information is used to develop management area allocations, ROS classifications, standards, and guidelines.

Key information needs:

Supply and demand for recreation opportunities are estimated during the forest planning process. However, aspects of supply and demand concerning type, quantity, and quality within non-motorized opportunities are difficult to estimate with general existing data and information sources. The supply and demand information is translated into ROS classes, acres currently available and those available (projected) in the future. Alternatives developed in the forest planning process will vary in the manner in which they address ROS class supply and demand.

- ◆ Assessment of recreation demand by ROS.
- ◆ Inventory of existing recreation supply – ROS.
- ◆ Projection of future ROS.

Key analytical tools and information sources:

- ◆ State Comprehensive Outdoor Recreation Plan (SCORP).
- ◆ National Survey Recreation Environment (NSRE).
- ◆ Social assessment.
- ◆ Focus/collaborative groups.

Subforest scale: This is not an issue at the subforest scale.

UR & RR (2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities? Is developing new roads into unroaded areas, decommissioning existing roads, or changing maintenance of existing roads causing significant changes in the quantity, quality, or type of roaded recreation opportunities?

(R2 suggests rewording this to “Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded and roaded recreation opportunities?” If user created routes are an issue in the area, you could consider the following question in conjunction with above, “How do user-created routes affect the management of the road system?”)

Forest plan scale: This is included in forest plan analysis in the EIS. We think this question is addressing past trends in unroaded and roaded recreation opportunities and how they may affect future trends.

Key information needs:

Ultimately, all forest recreation depends on the access provided by roads. Supply and demand for recreation opportunities are estimated during the forest planning process. However, aspects of supply and demand concerning type, quantity, and quality within non-motorized opportunities are difficult to estimate with general existing data and information sources. The supply and demand information is translated into ROS classes, acres currently available and those available as projected into the future. Alternatives developed in the forest planning process will vary in the manner in which they address ROS class supply and demand.

- ◆ Assessment of recreation demand by ROS.
- ◆ Inventory of existing recreation supply – ROS.
- ◆ Projection of future ROS.

Key analytical tools and information sources:

- ◆ State Comprehensive Outdoor Recreation Plan (SCORP).
- ◆ National Survey Recreation Environment (NSRE).
- ◆ Social assessment.
- ◆ Focus/collaborative groups.

Subforest scale: This is considered at the subforest scale if a trend identified in the forest plan shows a lack, or excess supply, of unroaded or roaded opportunities.

Key information needs:

The overall land allocation question of roaded vs. unroaded and motorized vs. non-motorized recreation opportunities are made at the plan level. In implementing the plan, site-specific analysis may confirm or indicate change is needed to the allocation. The information listed in FS-643 is appropriate but only in a site-specific context.

Key analytical tools and information sources:

- ◆ Focus groups.
- ◆ Public participation.

UR & RR (3): What are the effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality, and type of unroaded recreation opportunities? What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities? *(R2 suggest wording the combination of questions as “What are the adverse effects of noise and other disturbances caused by building, using, and*

maintaining roads on the quantity, quality, or type of unroaded and roaded recreation opportunities?)

Forest plan scale: This is not a programmatic issue.

Subforest scale: This is a rare issue. This question will be addressed if raised during project scoping. Although noise level itself is a rare issue, general disturbance factors (including noise) associated with expected recreation are addressed through the Recreation Opportunity Spectrum (ROS).

Key information needs:

- ◆ The information needs listed for question EF(5) in this document are most appropriate when this issue is raised.
- ◆ Distance of non-motorized opportunities from proposed road corridor.
- ◆ Topography.

Key analytical tools and information sources:

- ◆ Focus groups.
- ◆ Public participation.
- ◆ All tools, except those concerning fish and wildlife agencies, listed for question EF (5) in this document are appropriate when these issues are raised.

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The following four questions, UR(4), UR(5), RR(4), RR(5) are grouped for both the forest and subforest scale.

UR & RR (4): Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads? Who participates in roaded recreation in the areas affected by road constructing, maintaining, or decommissioning? (*R2 suggested question is “Who participates in unroaded recreation and road-related recreation in the areas affected by constructing, maintaining, and decommissioning roads?”*)

UR & RR (5): What are these participants’ attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Forest plan scale: These are included in forest plan analysis, in general terms, in the social analysis.

Key information needs:

- ◆ The forest plan social assessment and supporting data should provide information on which groups desire unroaded (non-motorized) and road-related recreation opportunities.
- ◆ The identification of issues of concern, strength of concern, and likely response.

Key analytical tools and information sources:

- ◆ Focus groups.
- ◆ Public participation processes.

- ♦ Sociological, psychological, anthropological measurement and observational methods.

These are also the most useful tools in addressing this question in the social assessment.

Subforest scale: This question will be addressed if raised during project scoping.

Key information needs:

- ♦ Project scoping and any associated social assessment and supporting data should provide information on which groups desire unroaded (non-motorized) and roaded recreation opportunities.
- ♦ The identification of issues of concern, strength of concern, and likely response.

Key analytical tools and information sources:

- ♦ Focus groups.
- ♦ Public participation processes.
- ♦ Sociological, psychological, anthropological measurement and observational methods.

UR & RR (6) How does the road system affect the Scenic Integrity? How is developing new roads, decommissioning of existing roads, or changing the maintenance of existing roads into unroaded areas affecting the Scenic Integrity? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality for Scenic Integrity. (Region 2 added this. There is no corresponding national direction.)

Forest plan scale: The SIOs are set during the forest planning process. Lack of roads is one element used in that process.

Key information needs:

- ♦ Determine the SIO(s) for areas of the forest using the Scenery Management System (SMS).

Key analytical tools and information sources:

- ♦ Recreation Opportunity Spectrum.
- ♦ *Landscape Aesthetics – A Handbook for Scenery Management.*

Subforest scale: This question will be addressed if raised during project scoping. The SIO(s) of the particular area is(are) determined in the Forest Plan. Design projects to meet the SIO(s) of the project area.

Key information needs:

- ♦ The SIO(s) for the area from the Forest Plan.

Key analytical tools and information sources:

- ♦ Apply landscape design principles to meet the SIOs for the area.

RR (7): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation? Note: This question was moved from the Social Issues section. It was question SI(8) in FS-643 document.

Background: Road management affects wilderness attributes and primitive recreation opportunities in many ways. The closure, presence, or addition of new roads and their management in proximity to wilderness areas can change the natural integrity and opportunities for solitude because of differences in vistas, amounts of noise and dust, and crowding. Roothing unroaded areas also affects consideration of these areas as additions to the National Wilderness Preservation System.

Forest plan scale: This scale is relevant.

Subforest scale: This scale is relevant.

Key information needs:

- ◆ Assessing effects of road management options on:
- ◆ Natural integrity
- ◆ Natural appearance
- ◆ Opportunities for solitude
- ◆ Opportunities for primitive recreation

Key analytical tools and information sources:

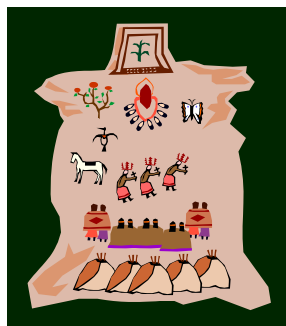
- ◆ Recreation opportunity spectrum
- ◆ EIS's for forest plans, Appendix C
- ◆ Wilderness plans
- ◆ USDA-FS Regional "Roadless Inventory Protocol"
- ◆ Descriptions of analysis methods, tools and their sources are available at the Forest Service Human Dimensions websites:
<http://www.srs.fs.fed.us/athens/index.htm>
- ◆ Roadless Rule map Appendix for IRA's
- ◆ Inter-agency website address for wilderness research which includes a wilderness publication library - <http://www.wilderness.net/research.cfm>.

Recommended references:

- ◆ White, Dave D.; Hendee, John C. 2000. Primal Hypotheses: The Relationship Between Naturalness, Solitude, and the Wilderness Experience Benefits of Development of Self, Development of Community, and Spiritual Development. In: McCool, Stephen F.; Cole, David N.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Wilderness science in a time of change conference—Volume 3: Wilderness as a place for scientific inquiry; 2000 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-3. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 3: 223-227.
- ◆ Leopold, A. 1925. Wilderness as a form of land use. *Journal of Land and Public Utility Economics* 14: 398-404.
- ◆ Leopold, A. 1949. *A Sand County Almanac*. Oxford: Oxford Univ. Press, Inc. 295 p.
- ◆ Marshall, R. 1930. The problem of the wilderness. *Science Monthly* 30: 141-148.
- ◆ Marshall, R. 1933. The forest for recreation and a program for forest recreation. *From: A National Plan for American Forestry*. Washington, DC: USDA - Forest

Service. Senate Document No. 12. US Government Printing Office.

- ◆ Marshall, R. 1937. The universe of the wilderness is vanishing. Nature: April edition.
- ◆ Nash, R. 1967. Wilderness and the American mind. New Haven, CN: Yale Univ. Press. 425 p.
- ◆ Vickery, J.D. 1986. Wilderness visionaries. Merrillville, IN: KS Books,. 263 p.



Passive-Use Value (PV)

Note: These have been incorporated into the Social Issues Questions.



Social Issues (SI) and Civil Rights and Environmental Justice (CR)

Introduction: The following section of questions is designed to elicit responses that will inform decision makers and stakeholders in a narrative format about the attitudes, values, uses, conflicts, and benefits people associate with access to the national forest and grasslands, the road system, and Forest Service travel management. This information, when integrated with other resource concerns, provides a framework for understanding the social tradeoffs of road system management opportunities. After completion of these questions and discussion with other resource specialists,

specific road segments and their associated social uses could be further explored using the analysis and mapping tools outlined in Appendix X of the Roads Analysis (*appendix is still under development*).

Access and travel management are predominantly social issues. The activities that people participate in during or at the end of their drive on the national forests and grasslands are generally the primary reason for their visit. Forest roads provide opportunities for all types of activities (motorized and non-motorized, summer and winter, etc.) for locals and visitors. Many people who visit the national forests and grasslands have special attachments to activities and places. Consequently, limiting, changing, or closing their type of access can produce strong reactions. Understanding people's use, motivation, and tolerance for change or substitutes, and incorporating or mitigating their needs into future road system management ensures Agency responsiveness to public needs.

People do not have to be active users of the Forest Service road system in order to hold values regarding access to Forest Service lands, or to benefit from the existence (or non-existence) of the road system. These "passive-use values" are values or benefits people receive from the existence of a specific place, condition, or thing - independent of any intention, hope, or expectation of themselves participating in active use of it. For example, some people believe that forest roads should be kept at a minimum because of the negative ecological impacts that are sometimes associated with roads (i.e. habitat fragmentation, water quality concerns). Others believe it is important to maintain large tracts of unroaded land in order to protect wilderness values, and leave a legacy of undeveloped land for future generations to experience. Alternatively, some people who do not use the Forest Service road system believe it is important to maintain or expand that system in order to promote values such as resource extraction opportunities, fire protection, and tourism. These passive use values are important to consider when making road management decisions and should be documented along side other types of use values.

The following questions regarding the social roles the road system plays should be answered at a scale appropriate to the level of analysis (e.g. forest-wide, watershed scale). The first five questions highlight people's motivation behind their desires for access to, use of, and relationship with national forest and grassland resources, and the role road management plays in providing these benefits. Next, there are three questions highlighting cultural and heritage issues associated with road management. These are followed by a question that addresses civil rights, and any potential disparate negative impacts associated with road management to

people who use the road system (environmental justice).

SI (1): Who are the direct users of the road system and of the surrounding areas? What activities are they directly participating in on the forest? Where are these activities taking place on forest?

Background: Access involves a person (who) making a decision to travel to a place or on a route (where), using one or more modes of transportation (how) at a certain time (when) for a specific reason (why), to participate in an activity (what). Question SI-1 should focus on the *who*, *what* and *where* portion of this larger definition of access. This discussion should include a description of who uses the forest road system for what types of uses and where the use is occurring. Other social questions will address the remainder of the access definition as well as the values and importance to national and local interests.

Many different people use the Forest Service road system, including residents of surrounding communities, visitors and tourists to national forests and grasslands, and groups of people (ethnic groups, subcultures, etc.) who may hold cultural, spiritual, sacred, traditional, or religious values associated with national forest system lands. Ensuring users are identified and considered will assist in developing an inclusive RAP process.

Understanding the types of uses and activities (the what) occurring on forest, commercial and non-commercial, legal and illegal, will assist in understanding why people come to the forest, the conflicts that arise, the values people hold for the forest, and attachments people form to places they visit.

Some activities can take place throughout the forest; many types of management areas or recreation opportunity (ROS) settings provide opportunities for driving for pleasure, hunting, fishing, wildlife viewing, or nature study. Other activities require more specific settings or infrastructure such as developed camping, rock climbing, hiking, Wilderness hiking, or boating. The more limited or rare an opportunity the more likely users will be interested in protecting their access to area. Considering such limits on specific opportunities of settings during the RAP process develops a spatial component of the analysis.

Forest plan Scale: The analysis of key forest routes (primarily level 3, 4, and 5 roads) will include almost all users of the national forests and grasslands. Highlight any general trends that may indicate changes in, or continued uses of, the road system.

Subforest scale: Analysis should highlight any special uses such as primitive recreation activities, annual events, fire protection, seasonal uses for hunting, fishing, winter sports, or other activities specific to the area. Specific groups or users of the area should be identified. For example, there may be a population of women (who) who collect mushrooms (what) off a specific road spur (where) each year for their personal use, or a large dispersed camping site (where) with trail access to a roadless area that attracts family reunions (who and what) each summer.

Key information needs:

- ◆ User surveys and assessments
- ◆ Special use permits, resource use records, recreation user/tourism information
- ◆ Commercial use permits

Key analytical tools and information sources:

- ◆ Public comment letters
- ◆ Local knowledge of district personnel

- ◆ Statewide tourism information
- ◆ Road surveys and traffic counts
- ◆ Maps delineating roads regarded as having high priority uses
- ◆ Forest plan
- ◆ Community development plans
- ◆ INFRA and SUDs databases
- ◆ Oregon State University [data-sharing website](http://govinfo.kerr.orst.edu/) (<http://govinfo.kerr.orst.edu/>).
- ◆ NRIS [Human Dimensions Module](http://www.fs.fed.us/emc/nris/hd/support/index.html) (<http://www.fs.fed.us/emc/nris/hd/support/index.html>).

Recommended references:

- ◆ Human Dimensions [Framework and Database for Social Assessments](http://hdf.itos.uga.edu/) (<http://hdf.itos.uga.edu/>).
- ◆ [Guidelines for Conducting a Social Assessment within a Human Dimensions Framework](http://www.srs.fs.fed.us/athens/index.htm) (<http://www.srs.fs.fed.us/athens/index.htm>).
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ◆ Interorganizational Committee on Guidelines and Principles. 1994. [Guidelines and principles for social impact assessment](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm) (http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm). Journal of Impact Assessment 12 (2): 107-152.

SI (2): Why do people value their specific access to national forest and grasslands - - what opportunities does access provide?

Background: Access is predominately a social issue; it means more than a road or trail. People can value existing opportunities for access, whether they exercise them or not -- while others can value areas that have limited or no opportunities for access, seeing access as negative. This question specifically addresses those people and activities identified in SI -1 and asks ‘Why do these people value their access?’

Because forest roads represent more than just a travel way to many people, there is concern and notably disparate views regarding roads and their management (see for example, public comment on the “Proposed Rulemaking on Administration of the Forest Development Transportation System”).

Some people perceive roads to be the only means of access to forest resources, on which they may be economically and culturally dependent. Other people perceive roads to be a deterrent to healthy wildlife habitat, or unacceptable contributors to stream sedimentation. Sometimes they value the fact that roads do not exist, as in wilderness areas, and believe these areas are critical to their individual, community, or ecosystem health. Certain types of recreation may be road-dependent, so users want roads maintained. Roads and road use may negatively affect other types of non-roaded recreation, and people thus express interest in wanting roads closed or decommissioned. Some of the values people hold for an area or a forest resource are spiritual, religious, or have ties to traditional customs.

Changes to the road system can affect people’s values and experiences in many ways. Road obliteration, closure, reconstruction, or construction, or a change in management of an existing road in proximity to unique or special areas can change not only the access, but also

the experience in terms of natural integrity, opportunities for solitude, vistas, noise and dust levels, and crowding in adjacent forest lands. Understanding why people value and desire providing access, or limiting access to an area will help decision makers understand how changes in road management may impact peoples' current uses and future of the forest.

Forest plan scale: Analysis addresses overall value of access expressed by groups and individuals identified in SI-1.

Subforest scale: Analysis highlights values of access associated with specific users on roads or trails. To expand on the examples given in SI-1, a group of women come to a specific spur road each year to harvest mushroom for their personnel use – they may be harvesting mushrooms to use for medicinal purposes and thus value their access to the forest in terms of their health and quality of living. People who return each year to the same dispersed camping area for a family reunion value their access to the forest for family connectedness, but at the same time, they may also value the limited road system because they enjoy their hiking access into the adjacent roadless area. These are the types of values people hold toward their access, and often are the basis for conflicts when management changes current opportunities or new/different user groups begin using the same area. Thus these values are important to understand when considering travel management.

Key information Needs:

- ◆ Criteria used for RMO level 3, 4, 5 for Forest-wide scale RAP.
- ◆ Assessment of values held for access and assessment of needs for access

Key analytical tools and information sources:

- ◆ Local knowledge of district personnel and forest users
- ◆ Social assessment
- ◆ Constituent analysis
- ◆ Forest plan
- ◆ Public comments

Recommended references:

- ◆ Human Dimensions [Framework and Database for Social Assessments](http://hdf.itos.uga.edu/) (<http://hdf.itos.uga.edu/>).
- ◆ [Guidelines for Conducting a Social Assessment within a Human Dimensions Framework](http://www.srs.fs.fed.us/athens/index.htm) (<http://www.srs.fs.fed.us/athens/index.htm>).
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ◆ Interorganizational Committee on Guidelines and Principles. 1994. [Guidelines and principles for social impact assessment](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm) (http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm). Journal of Impact Assessment 12 (2): 107-152.

SI (3): What are the broader social and economic benefits and costs of the current forest road system and its management?

Background: This question includes costs and benefits to surrounding communities in terms of social and economic well-being (for example, lifestyles, quality of life, infrastructure

maintenance) as well as uses and values held by individuals and groups associated with access, resource concerns, passive use values, unique cultural, traditional symbolic, sacred, spiritual, or religious significance. This question addresses all interested people, not just local or direct users of the road system. National interest groups as well as local community concerns should be included. Concerns should focus on those secondary, or indirect values that have not already been discussed in SI-1 or SI-2. This question is directly linked to EC-2 and these may be answered together, EC-2 focuses on quantitative analysis while SI-3 focuses on qualitative information.

Many communities and individuals have social and economic dependencies on forest roads and the resources provided by access to them. Changes to a road system or in road management may affect (positively or negatively) local commuting patterns, lifestyles, forest resource-related businesses, the collection of special forest products; school bus routes; firefighting access needs in the wildland-urban interface; and access to municipal water supplies, power lines, and other local infrastructure.

The benefits provided to communities around national forests extend beyond those who directly access or use forest resources. For example, people owning or working in businesses in 'gateway' communities often benefit from tourism associated with people visiting their national forest. Local businesses also benefit through resource activities including timber harvest, grazing, road development and maintenance, water projects, and other special uses in terms of potential economic activity.

Communities may benefit with infrastructure development that enhances their local quality of life, but at the same time, may negatively impact surrounding resources other people value for their quality of life. These externalities may include impact to resources such as soil, water, habitat, visual or damage to values people hold to an area such as an unroaded character, limited accessibility, or solitude. Such costs should be included and considered in any analysis of a road system and its management.

Others from ethnic groups, subcultures, tribes, national interest groups, as well as local residents of the area can hold cultural, spiritual, sacred, traditional, symbolic, or religious values associated with access to specific places, opportunities or resources on the national forest. These passive use, or indirect use values need to be identified and considered along with more use direct values.

These values nationally and locally need to be considered over time in terms of incremental changes that have occurred. As roads are constructed or closed mile by mile in individual projects, the impact does not seem great at such a small scale, but considering the roading or closures that have occurred in an area over time, and the change is sometimes significant. It is important to be aware of these larger changes and understand that often Forest Service projects are a balance between local and national values.

Forest plan scale: Analysis should focus on the larger road system providing access to infrastructure and potential resource projects and how local communities relate to those resources and infrastructure. Special interest areas, Research Natural Areas, Wilderness, inventoried roadless areas, and other special designations should be considered as well as location of TES plants, animals, and fish to highlight where national interest group's values have been incorporated into land use decisions. Values associated with specific areas, experiences or resources should be considered both for local and national interests.

Subforest scale: Focus on specific resources accessible by current road system and relations to local communities. Locations surrounding the project area that may serve as

substitute sites, in the event access to another area is changed, should be identified – or if resource opportunities are unique at the project, forest, or regional scale, the lack of substitute sites should be highlighted.

Key information Needs:

- ◆ Social and economic assessment
- ◆ Resource uses, (as indicated in related questions).
- ◆ Special interest areas, Research Natural Areas, inventoried roadless areas, wilderness, TES locations

Key analytical tools and information sources:

- ◆ Statewide tourism and forest resource activity.
- ◆ Region One [EASy](http://www.fs.fed.us/r1/planning/econ/easy/) website (<http://www.fs.fed.us/r1/planning/econ/easy/>).
- ◆ Forest plan
- ◆ INFRA and SUDs databases
- ◆ Oregon State University [data-sharing website](http://govinfo.kerr.orst.edu/) (<http://govinfo.kerr.orst.edu/>).
- ◆ NRIS [Human Dimensions Module](http://www.fs.fed.us/emc/nris/hd/support/index.html) (<http://www.fs.fed.us/emc/nris/hd/support/index.html>).

Recommended references:

- ◆ Human Dimensions [Framework and Database for Social Assessments](http://hdf.itos.uga.edu/) (<http://hdf.itos.uga.edu/>).
- ◆ [Guidelines for Conducting a Social Assessment within a Human Dimensions Framework](http://www.srs.fs.fed.us/athens/index.htm) (<http://www.srs.fs.fed.us/athens/index.htm>).
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ◆ Interorganizational Committee on Guidelines and Principles. 1994. [Guidelines and principles for social impact assessment](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm) (http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm). Journal of Impact Assessment 12 (2): 107-152.

SI (4): How does the road system and road management contribute to or affect people's sense of place? *Note: This is similar to SI(10) in FS-643 document.*

Background: "Sense of place" describes the character of a physical location and the meaning, value, and feelings that people attach to it because of their experiences there. It integrates interpretations of a geographic place, including the biophysical setting, psychological influences (memory, choice, perception, imagination, emotion), and social and cultural influences. Changes in road management can affect access to these special places, or change their biophysical setting, affecting what people value or desire about an area, and their sense of place.

People's sense of place is directly tied to the characteristics of an area, including the area within a road corridor, that invoke a special feeling or attachment to the area. Factors may include the area's vegetation, fish and wildlife resources, amount of sunlight available, views, solitude, opportunities that make it a destination, and the overall familiarity to an individual or group. Roads often facilitate a person's enjoyment of the area by providing for driving comfort, the amount and type of use, and any number of aesthetic attributes visible alongside

the road. Sometimes the road itself is the place a person enjoys. People have local name for specific roads, they enjoy driving specific routes, and consider such driving activity a part of their connection with an area. These attributes are directly related to road management. Any changes in this management will likely change people's sense of place and impact current uses.

Some places are significant enough to individuals, groups, or communities that if the opportunity to use a specific site is lost, the continuation of those activities no longer takes place – there is no substitute site for the activity because the site itself is the reason people participate. The presence or absence of substitute sites, and the potential displacement of people from their 'chosen' site should be considered.

Forest plan scale: Analysis considers communities of interest to provide a general description of the places on the forest accessed by roads, or within unroaded areas. Document specific places on the forest known to be special places to specific groups of people, and the role of roads in providing access to those places.

Subforest scale: Analysis should include specific information about the sense of place people hold for an area and what role the current road system and access play in their enjoyment of the area.

Key information Needs:

- ◆ Assessment of people's sense of place and how roads and access affect people's sense of place

Key analytical tools and information sources:

- ◆ USDA-FS Region One "[Sense of Place Protocol](http://fsweb.r1.fs.fed.us/em/protocols/sop_protocol.pdf)" (http://fsweb.r1.fs.fed.us/em/protocols/sop_protocol.pdf).
- ◆ Human Dimensions [Framework and Database for Social Assessments](http://hdf.itos.uga.edu/) (<http://hdf.itos.uga.edu/>).
- ◆ [Guidelines for Conducting a Social Assessment within a Human Dimensions Framework](http://www.srs.fs.fed.us/athens/index.htm) (<http://www.srs.fs.fed.us/athens/index.htm>).
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ◆ Interorganizational Committee on Guidelines and Principles. 1994. [Guidelines and principles for social impact assessment](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm) (http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm). Journal of Impact Assessment 12 (2): 107-152.

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SI (5): What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc?

Background: Conflicts often occur between different types of users - - motorized vs. non-motorized, hunting/fishing vs. non-consumptive users, recreational users vs. tourism, and resource preservation vs. resource extraction. Understanding these conflicts provides needed context for road management, enabling decision-makers to predict the social effects of their decisions with regard to existing conflicts. It will also help decision-makers to formulate road management decisions that may help resolve or mitigate these conflicts.

Forest plan scale: Analysis focuses on general road-related conflicts within the forest and potential solutions.

Subforest scale: Analysis highlights specific areas or groups in conflict, and past mitigation measures with a measure of success.

Key information Needs:

- ◆ Survey of forest uses and users
- ◆ Conflict resolution techniques
- ◆ Visitor use statistics
- ◆ Population trends
- ◆ Resource uses

Key analytical tools and information sources:

- ◆ Newspaper articles
- ◆ Public comments from past projects
- ◆ Past mitigation measures from road conflicts
- ◆ INFRA and SUDs databases

Recommended references:

- ♦ Human Dimensions [Framework and Database for Social Assessments](http://hdf.itos.uga.edu/) (<http://hdf.itos.uga.edu/>).
- ♦ [Guidelines for Conducting a Social Assessment within a Human Dimensions Framework](http://www.srs.fs.fed.us/athens/index.htm) (<http://www.srs.fs.fed.us/athens/index.htm>).
- ♦ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ♦ Interorganizational Committee on Guidelines and Principles. 1994. [Guidelines and principles for social impact assessment](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm) (http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm). Journal of Impact Assessment 12 (2): 107-152.

CH (1): How does the road system affect access to paleontological, archaeological, and historical sites and the values people hold for these sites? *Note: This is similar to SI(3) in FS-643 document.*

Background: Access to paleontological, archaeological, and historical sites provides opportunities for studying, learning about, and enjoying our natural history and cultural heritage. Access to these sites may also increase risks of unintended physical damage, crowding-out other users and uses of the sites, and vandalism.

Forest plan scale: Analysis would include major, significant sites accessed by forest roads, as well as those not currently road accessible. Indicate why sites are, or are not road accessible and if future plan exist to alter the situation. Public interest and concern about these sites should also be highlighted.

Subforest scale: Analysis would include specific sites and the roads that access those sites at a finer scale than above. In the case of sites that are not currently accessible by roads, indicate why, and if that will remain in the future.

Key information Needs:

- ♦ Location of paleontological, archaeological, and historical sites and location of roads accessing them.
- ♦ [Section 106](http://www.achp.gov/regs.html) (<http://www.achp.gov/regs.html>) of NHPA must be considered.
- ♦ Identify access people desire to these sites and why, or whether the road facilitates undesirable access.

Key analytical tools and information sources:

- ♦ Heritage survey atlases and heritage overviews.
- ♦ [Heritage INFRA database](http://fsweb.wo.fs.fed.us/rhwr/heritage/nhimi/infra/module.html) (<http://fsweb.wo.fs.fed.us/rhwr/heritage/nhimi/infra/module.html>).

Recommended references:

- ♦ [National Register Bulletin 38](http://www2.cr.nps.gov/tribal/bull3803.html): (<http://www2.cr.nps.gov/tribal/bull3803.html>) 1991. "Guidelines for evaluating and documenting traditional cultural properties", Washington, DC: US Department of the Interior, National Park Service, Interagency Resources Division
- ♦ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.

CH (2): How does the road system and road management affect the exercise of American Indian treaty rights? *Note: This question is similar to SI(4) in FS-643 document.*

Background: Road management changes may affect the exercise of American Indian treaty rights. Closing a road that accesses an area where reserved treaty rights or other uses have been traditionally exercised (subsistence, ceremonial) might hinder these activities. Likewise, increased access to an area can increase conflicts between competing users.

Forest plan scale: Analysis would include aboriginal use areas, traditional lands, usual and accustomed areas, ceded land or territory, or treaty area boundaries accessed by forest roads.

Subforest scale: Analysis would highlight specific sites and the roads that access those sites.

Key information Needs:

- ◆ Locations of traditional subsistence and collecting areas, practices, and access to these locations.
- ◆ **Federally Recognized Tribes** (<http://www-libraries.colorado.edu/ps/gov/us/fedrec.htm>).

Key analytical tools and information sources:

- ◆ Regional Tribal Relations Staff
- ◆ Constituent analysis, social assessment, or both
- ◆ Heritage survey atlases and heritage overviews
- ◆ Coordination and collaboration with affected tribes and interest groups
- ◆ Appropriate treaties

Recommended references:

- ◆ [Historic occupancy locations of tribes](http://www.wes.army.mil/e/ccspt/natamap/usa_pg.html) (http://www.wes.army.mil/e/ccspt/natamap/usa_pg.html)
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.
- ◆ [Forest Service National Resource Guide to American Indian and Alaska Native Relations](http://www.fs.fed.us/people/tribal/) (<http://www.fs.fed.us/people/tribal/>).
- ◆ [National Tribal Relations Program Task Force](http://www.r5.fs.fed.us/tribal-relations/reports.htm) (<http://www.r5.fs.fed.us/tribal-relations/reports.htm>).

CH (3): How does road use and road management affect roads that constitute historic sites? *Note: This question is similar to SI(5) in FS-643 document.*

Background: Some roads constitute historic sites under the National Historic Preservation Act (1966). In some cases, a bridge or trail along the road system may be the historic site and should be considered as well. Management opportunities being developed for these sites must address compliance with this act.

Forest plan scale: Analysis would include significant road, bridge, and trail sites accessed by forest roads.

Subforest scale: This is an appropriate scale because of the need to look at specific roads, bridges, and sites.

Key information Needs:

- ◆ Historic background of a road, bridge, or trail (date of original construction, modifications over time, purpose for constructing road).

Key analytical tools and information sources:

- ◆ National Register of Historic Places eligibility criteria.
- ◆ Heritage sites atlas and historic overviews.

Recommended references:

- ◆ Title 36 Code of Federal Regulations, Section 800
- ◆ National Historic Preservation Act
- ◆ National Register of Historic Places
- ◆ [Forest Roads](http://www.fs.fed.us/eng/road_mgt/science.pdf) (http://www.fs.fed.us/eng/road_mgt/science.pdf): A Synthesis of Scientific Information. June 2000.

CR (1): Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations? *Note: This is an expansion of question CR(1) in FS-643 document.*

Background: People are affected by changes in road management and the access afforded by roads. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires Federal agencies to identify and address "...disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations ...". In addition, Department of Agriculture agencies are required, per the Secretary of Agriculture's 1978 decision, to identify and address the civil rights implications of proposed agency actions in their management decisions.

Forest plan scale: Identify and consider all communities within and around the forest - especially those connected by the road system.

Subforest scale: Identify and consider all communities within and surrounding the project area.

Key information needs:

- ◆ Identify low-income, minority, and disabled populations that live around or use the forest, or could be potentially affected by road management.
- ◆ Identify what uses/activities these populations are using the roads system for.

Key analytical tools and information sources:

- ◆ NRIS [NRIS Human Dimensions Module](http://www.fs.fed.us/emc/nris/hd/support/index.html) (<http://www.fs.fed.us/emc/nris/hd/support/index.html>).
- ◆ Public involvement and outreach with groups who might be disproportionately affected.
- ◆ Social assessment or Forest Plan Social Impact Analysis.
- ◆ Public Outreach Plans to underserved communities.

Recommended references:

- ♦ [Americans with Disabilities Act](http://www.eeoc.gov/laws/ada.html) (<http://www.eeoc.gov/laws/ada.html>).
- ♦ [Forest Service Interim Strategic Public Outreach Plan](http://fsweb.wo.fs.fed.us/cr/national_programs/correspondence/spop/fsspop.pdf)
(http://fsweb.wo.fs.fed.us/cr/national_programs/correspondence/spop/fsspop.pdf)
- ♦ [Executive Order 12898](http://www.fs.fed.us/land/envjust.html) (<http://www.fs.fed.us/land/envjust.html>): Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. February 11, 1994
- ♦ Environmental Justice [CEQ guidelines](http://www.whitehouse.gov/CEQ/) (<http://www.whitehouse.gov/CEQ/>) for NEPA analysis
- ♦ USDA Forest Service Handbook 1909.17

Return to [table](#).

Appendix

Documentation Table

The following table should be used in conjunction with Table 1 in the Region 2 Roads Analysis Guidance package. It is designed to document the consideration of the questions, to describe how and where the example questions in Step 4 were considered, and to allow quick location of the analysis discussion. Rationale for not addressing a particular question need not be complex or verbose (see following examples).

Documentation Table for Step 4 of the Roads Analysis procedures. (from Miscellaneous Report FS-643).

Question #	Addressed in Analysis? (YES/NO)	If directly addressed, page # in Environmental Document; and/or S&G, or location in Forest Plan.	If indirectly addressed, location in Project Administrative Record.	Rationale for not addressing - location in Project Administrative Record.
AQ1	yes	FEIS 3-122, Plan FW Water & Aquatic S-4		
AQ2	yes	FEIS 3-122, Plan FW Water & Aquatic S-5		
AQ3				
AQ4				
AQ5	no			This is not a programmatic issue
AQ6				
AQ7	yes	Plan FW Water & Aquatic G-6	Vol. 18/6 p245-266	
AQ8				
AQ9				
AQ10				
AQ11				
AQ12				
AQ13				
AQ14				
TW1				
TW2				
TW3				
TW4				
EC1				
EC2				
EC3				
TM1				
TM2				
TM3				
MM1				
RM1				
WP1				
WP2				
WP3				
SP1				

Question #	Addressed in Analysis? (YES/NO)	If directly addressed, page # in Environmental Document; and/or S&G, or location in Forest Plan.	If indirectly addressed, location in Project Administrative Record.	Rationale for not addressing - location in Project Administrative Record.
SU1				
GT1				
GT2				
GT3				
GT4				
AU1				
AU2				
PT1				
PT2				
PT3				
PT4				
UR1				
UR2				
UR3				
UR4				
UR5				
UR6				
RR1				
RR2				
RR3				
RR4				
RR5				
RR6				
RR7				
SI1				
SI2				
SI3				
SI4				
SI5				
CH1				
CH2				
CH3				
CR1				

Definitions

The following are the definitions from the Final Rule and Policy as published in the Federal Register on January 12, 2001. These definitions supercede the definitions in FS-643.

Classified Road: Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long term motor vehicle access, including state roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

Forest Roads: As defined in Title 23 Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Forest Road Atlas: A key component of the Forest Transportation Atlas and, consistent with the road inventory, includes all classified and unclassified roads on National Forest System lands. See FSM 7711.1.

Forest Transportation Atlas: An inventory, description, display, and other associated information for those roads, trails, and airfields that are important to the management and use of resources upon which communities within or adjacent to the National Forests depend.

Forest Transportation Facility: A classified road, designated trail, designated airfield, including bridges, culverts, parking lots, log transfer facilities, safety devices and other transportation network appurtenances, under Forest Service jurisdiction that is wholly or partially adjacent to National Forest System lands.

National Forest System Road: A classified forest road under the jurisdiction of the Forest Service. The term “National Forest System roads” is synonymous with the term “forest development roads” as used in 23 U.S.C. 205.

New Road Construction: Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1).

Private Road: A road under private ownership authorized by an easement to a private party, or a road that provides access pursuant to a reserved or private right (unchanged from FS-643).

Public Road: Any road or street under the jurisdiction of, and maintained by, a public authority and open to public travel (23 U.S.C. 101(a)).

Road: A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

Road Decommissioning: Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

Road Maintenance: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3).

Road Reconstruction: Activity that results in improvement or realignment of an existing road as defined below:

- a. **Road Improvement:** Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.
- b. **Road Realignment:** Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Roads Subject to the Highway Safety Act: National Forest System roads that are open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use.

Temporary Roads: Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management.

Transportation Facility Jurisdiction: The legal right to control or regulate use of a transportation facility derived from fee title, an easement, an agreement, or other similar method. While jurisdiction requires authority, it does not necessarily reflect ownership.

Unclassified Road: Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).

Question Comparison

The following chart lists the Questions from Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643) with the corresponding question from the R2 Roads Analysis Supplement to FS-643.

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
EF(1)	What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?	Same
EF(2)	To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?	Same
EF(3)	To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?	Address EF(3) and EF(4) together: To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites? How does the road system affect ecological disturbance regimes in the area?
EF(4)	How does the road system affect ecological disturbance regimes in the area?	See above.
EF(5)	What are the adverse effects of noise caused by developing, using, and maintaining roads?	Same
AQ(1)	How and where does the road system modify the surface and subsurface hydrology of the area?	Same
AQ(2)	How and where does the road system generate surface erosion?	Same
AQ(3)	How and where does the road system affect mass wasting?	Same
AQ(4)	How and where do road-system crossings influence local stream channels and water quality?	Same
AQ(5)	How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides to enter surface waters?	Same

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
AQ(6)	How and where is the road system 'hydrologically connected' to the stream system? How do the connections affect water quality and quantity (such as delivery of sediments, thermal increases, elevated peak flows)?	Same
AQ(7)	What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?	Same – suggest answering WP(2) at the same time: How does road development and use affect water quality in municipal watersheds?
AQ(8)	How and where does the road system affect wetlands?	Same
AQ(9)	How does the road system alter physical channel dynamics, including isolation of floodplains; constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?	Same
AQ(10)	How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?	Same
AQ(11)	How does the road system affect shading, litterfall, and riparian plant communities?	Same
AQ(12)	How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?	Same
AQ(13)	How and where does the road system facilitate the introduction of non-native aquatic species?	Same – remember to consider plants and mullusks
AQ(14)	To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?	Same
TW(1)	What are the direct effects of the road system on terrestrial species habitat?	What are the direct and indirect effects of the road system on terrestrial species habitat?
TW(2)	How does the road system facilitate human activities that affect habitat?	Same
TW(3)	How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the effects on wildlife species?	How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the direct and indirect effects on wildlife species?

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
TW(4)	How does the road system directly affect unique communities or special features in the area?	Same
EC(1)	How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?	Same
EC(2)	How does the road system affect priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?	Same
EC(3)	How does the road system affect the distribution of benefits and costs among affected people?	Same
TM(1)	How does road spacing and location affect logging system feasibility?	Same – however, address TM(2) and TM(3) first.
TM(2)	How does the road system affect managing the suitable timber base and other lands?	Answer in conjunction with TM(3): How does the road system affect managing the suitable timber base and other lands? How does the road system affect access to timber stands needing silvicultural treatment?
TM(3)	How does the road system affect access to timber stands needing silvicultural treatment?	See above.
MM(1)	How does the road system affect access to locatable, leasable, and salable minerals?	Same
RM(1)	How does the road system affect access to range allotments?	How does the road system affect rangeland management? (This encompasses the entire situation including issues such as gates left open, funding and maintaining cattle guards, need for increased fencing, creation of travel routes for livestock, increased public access and issues with that, etc.)
WP(1)	How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?	Same
WP(2)	How does road development and use affect the water quality in municipal watersheds?	See AQ(7) above.
WP(3)	How does the road system affect access to hydroelectric power generation?	Same
SP(1)	How does the road system affect access for collecting special forest products?	Same

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
SU(1)	How does the road system affect managing special-use permit sites (concessionaires, communication sites, utility corridors, and so on)?	Same
GT(1)	How does the road system connect to public roads and provide primary access to communities?	Same
GT(2)	How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings, and so on)?	Same
GT(3)	How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?	Same
GT(4)	How does the road system address the safety of road users?	Same
AU(1)	How does the road system affect access for research, inventory, and monitoring?	Same
AU(2)	How does the road system affect investigative or enforcement activities?	Same
PT(1)	How does the road system affect fuels management?	Same
PT(2)	How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?	Same
PT(3)	How does the road system affect risk to firefighters and to public safety?	Same
PT(4)	How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?	Same
UR(1)	Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?	Address with RR(1): What are the supply and demand relationships for unroaded and/or roaded recreation opportunities? (unroaded = non-motorized; roaded = motorized).

Question	Question from Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)	Suggested Question the Forest Should Consider Addressing from the R2 Roads Analysis Supplement to FS-643
UR(2)	Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?	Address with RR(2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded and roaded recreation opportunities? If user created routes are an issue in the area, consider the following question also: How do user created routes affect the management of the road system?
UR(3)	What are the effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality, and type of unroaded recreation opportunities?	Address with RR(3): What are the adverse effects of noise and other disturbances caused by building, using, and maintaining roads on the quantity, quality or type of unroaded and roaded recreation opportunities?
UR(4)	Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?	Address with RR(4): Who participates in unroaded recreation and road-related recreation in the areas affected by constructing, maintaining, and decommissioning roads?
UR(5)	What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?	Address with RR(5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?
UR(6)	There is no corresponding National question.	Address with RR(6): How does the road system affect the Scenic Integrity? How is developing new roads into unroaded areas affecting the Scenic Integrity? (If still under the Visual Management System, substitute Visual Quality for Scenic Integrity).
RR(1)	Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities?	See UR(1) above.
RR(2)	Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?	See UR(2) above.
RR(3)	What are the effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality, and type of roaded recreation opportunities?	See UR(3) above.

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
RR(4)	Who participates in roaded recreation in the areas affected by constructing, maintaining, or decommissioning?	See UR(4) above.
RR(5)	What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?	See UR(5) above.
RR(6)	There is no corresponding National question.	See UR(6) above.
PV(1)	Do areas planned for road entry, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species?	This question has been incorporated into the Social Issues Questions.
PV(2)	Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?	This question has been incorporated into the Social Issues Questions.
PV(3)	What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for unroaded areas planned for road entry or road closure?	This question has been incorporated into the Social Issues Questions.
PV(4)	Will road construction, closure, or decommissioning significantly affect passive-use value?	This question has been incorporated into the Social Issues Questions.
The SI and CR questions from FS-643 have been reorganized and renumbered by a National effort into SI, CH, and CR questions. These have been placed in the second column across from the similar question from FS-643 where appropriate. The numbers from the R2 Roads Analysis Supplement to FS-643 are shown in bold in the second column.		
SI(1)	What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?	SI(1): Who are the direct users of the road system and of the surrounding areas? What activities are they directly participating in on the forest? Where are these activities taking place?
SI(2)	What are people's perceived needs and values for access? How does road management affect people's dependence on, need for, and desire for access?	SI(2): Why do people value their specific access to national forest and grasslands – what opportunities does access provide?
SI(3)	How does the road system affect access to paleontological, archaeological, and historical sites?	CH(1): How does the road system affect access to paleontological, archaeological, and historical sites and the values people hold for these sites? <i>(Similar to SI(3) in FS-643).</i>

Question	Question from <i>Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643)</i>	Suggested Question the Forest Should Consider Addressing from the <i>R2 Roads Analysis Supplement to FS-643</i>
SI(4)	How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?	CH(2): How does the road system and road management affect the exercise of American Indian treaty rights? <i>(Similar to SI(4) in FS-643).</i>
SI(5)	How are roads that are historic sites affected by road management?	CH(3): How does road use and road management affect roads that constitute historic sites? <i>(Similar to SI(5) in FS-643).</i>
SI(6)	How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?	SI(3): What are the broader social and economic benefits and costs of the current forest road system and its management?
SI(7)	What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?	SI(5): What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc.?
SI(8)	How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?	
SI(9)	What are the traditional uses of animal and plant species within the area of analysis?	
SI(10)	How does road management affect people's sense of place?	SI(4): How does the road system and road management contribute to or affect people's sense of place? <i>(Similar to SI(10) in FS-643).</i>
CR(1)	How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?	CR(1): Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations? <i>(Similar to CR(1) in FS-643).</i>

Question Crosswalk

Some of the questions in FS-643, Appendix 1 are related. In this R2 Supplement, we combined those questions that we felt were so similar that it was practical to answer them together. These are shown in the second column of the table. Many questions are related. At the very least, it is important to compare the responses. These questions are shown in the third column.

Question	Questions combined in R2 guidance; suggest answering them together	Like Questions, suggest comparing responses
AQ(1)		AQ(6)
AQ(2)		AQ(6)
AQ(3)		AQ(6)
AQ(4)		AQ(6)
AQ(5)		AQ(6)
AQ(6)		AQ(1, 2, 3, 4, 5)
AQ(7)	WP(2)	WP(3), SI(3)
AQ(8)		TW(4), EF(1, 2)
AQ(9)		
AQ(10)		
AQ(11)		
AQ(12)		TW(3), SI(5)
AQ(13)		EF(2)
AQ(14)		TW(4), EF(1)

Question	Questions combined in R2 guidance; suggest answering them together	Like Questions, suggest comparing responses
TW(1)		
TW(2)		
TW(3)		AQ(12), EF(5), UR(3), RR(3), CH(2)
TW(4)		SI(3), AQ(8, 14), EF(1-2)
EF(1)		AQ(8, 14), TW(4), EF(2), SI(3)
EF(2)		AQ(8, 13), EF(1), TW(4), SI(5)
EF(3)	EF(4)	
EF(4)	EF(3)	
EF(5)		TW(3), UR(3), RR(3), SI(5)
EC(1)		
EC(2)		SI(1)
EC(3)		SI(3)
TM(1)		SI(1)
TM(2)	TM(3)	
TM(3)	TM(2)	
MM(1)		SI(1)
RM(1)		SI(1)

Question	Questions combined in R2 guidance; suggest answering them together	Like Questions, suggest comparing responses
WP(1)		SU(1), SI(1, 3)
WP(2)	AQ(7)	SI(1, 3)
WP(3)		AQ(7), SU(1), SI(1, 3)
SP(1)		UR(4-5), RR(4-5), CH(2),
SU(1)		WP(1, 3), SI(1)
GT(1)		SI(1, 3), CR(1)
GT(2)		SI(3)
GT(3)		
GT(4)		AU(2)
AU(1)		
AU(2)		GT(4), SI(5)
PT(1)		SI(3, 5)
PT(2)		SI(3)
PT(3)		SI(3)
PT(4)		SI(3, 5)
UR(1)	RR(1)	SI(5)
UR(2)	RR(2)	SI(5)
UR(3)	RR(3)	TW(3), EF(5)

Question	Questions combined in R2 guidance; suggest answering them together	Like Questions, suggest comparing responses
UR(4)	RR(4)	SP(1), SI(1)
UR(5)	RR(5)	SP(1), SI(4)
UR(6)	RR(6)	
RR(1)	UR(1)	SI(5)
RR(2)	UR(2)	SI(5)
RR(3)	UR(3)	TW(3), EF(5)
RR(4)	UR(4)	SP(1), SI(1)
RR(5)	UR(5)	SP(1), SI(4)
RR(6)	UR(6)	
RR(7)		
SI(1)		EC(2), TM(1), MM(1), RM(1), WP(1, 2, 3), SU(1), GT(1), UR(4), RR(4), SI(2, 4), CH(1-2)
SI(2)		SI(1, 4, 5), CR(1)
SI(3)		GT(1, 2), AQ(7), WP(1, 2, 3), PT(1, 2, 3, 4), EC(3), EF(1), TW(4), CH(1), CR(1)
SI(4)		UR(5), RR(5), CH(1), SI(1-2)
SI(5)		EF(2, 5), AQ(12), AU(2), PT(1, 4), SI(2), RR(1, 2), UR(1, 2)
CH(1)		SI(1, 3, 4)
CH(2)		TW(3), SP(1), SI(1), CR(1)
CH(3)		

Question	Questions combined in R2 guidance; suggest answering them together	Like Questions, suggest comparing responses
CR(1)		GT(1), SI(2-3), CH(2)